

GBPPR 'Zine



Issue #76 / The Monthly Journal of the American Hacker / August 2010

"One important development would be for the [Obama] administration to pick up its anti-Fox position, which sort of petered out. For the 2012 Democratic convention, the DNC should simply refuse to give Fox News a skybox, like the rest of the networks. If Sean Hannity wants to report on the convention, then he should go sit with the bloggers. I, for one, would pay a chunk of change to hear his conversation with Markos.

The point would be to create a sort of echo chamber that the Reps use.

I hate to open this can of worms, but is there any reason why the FCC couldn't simply pull their broadcasting permit once it expires?"

— March 12, 2010 quote from UCLA law professor Jonathan Zasloff (Jew) on the now "not-so-secret" JournoList mailing list. Now that's change!

Where's the outrage from Eric Corley?

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Customer Controlled Station Restriction Feature / #1A ESS

BELL SYSTEM PRACTICES
AT&T Co SPCS

SECTION 231-090-351
Issue 1, June 1980

FEATURE DOCUMENT CUSTOMER CONTROLLED STATION RESTRICTION (CCSR) FEATURE 2-WIRE NO. 1 AND NO 1A ELECTRONIC SWITCHING SYSTEMS

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NOTICE

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INTRODUCTION

1. GENERAL INFORMATION

SCOPE

1.01 This document provides information concerning the use of the Customer Controlled Station Restriction (CCSR) feature.

REASON FOR REISSUE

1.02 When this document is reissued, the reason for reissue will be stated in this paragraph.

FEATURE AVAILABILITY

1.03 The CCSR feature is initially available in the 1E3 generic program for No. 1 ESS. It is available in 1AE4 for No. 1A ESS. The CCSR feature is included in the Inquiry Response System (IRES) feature group, which is optionally loadable.

2. DEFINITION

2.01 *The Customer Controlled Station Restriction (CCSR)* feature enables customers such as hotels, motels, and hospitals to restrict originating calls from room telephones and/or restrict terminating calls to room telephones.

DESCRIPTION

3. USER OPERATION

CUSTOMER

3.01 Within a functional group, combinations of the following controlled restrictions are provided according to customer option.

- Controlled outward restriction (OWR) permits the attendant and/or certain administrative lines to control the restriction of direct-dialed outgoing local central office and toll calls for selected station lines or groups of lines. When activated, restricted calls are routed to reorder.
- Controlled termination restriction, also referred to as inward restriction (IWR), permits the attendant and/or certain administrative lines to control the restriction of receiving any calls for individual station

lines or groups of lines. However, these same lines may receive calls from and through the attendant via emergency override while the restriction is activated. When activated, the restricted calls are routed (depending upon the option selected) to a recorded intercept announcement, to an intercept tone, or to an attendant.

- Controlled station-to-station restriction, also referred to as intracentrex inward restriction (IIWR), permits the attendant and/or certain administrative lines to control the restriction of receiving station-to-station calls for groups of lines. The attendant can make station calls while the restriction is activated. Use of the "emergency override" access code is not required. When activated, restricted calls are routed to a recorded intercept announcement.
 - Controlled total restriction permits the attendant and/or certain administrative lines to control the restriction of originating and receiving calls for selected lines and groups of lines. Optionally, these same lines can originate to and receive calls from and through the attendant while the restriction is activated. When activated, the restricted calls are routed (depending upon the option selected) to a recorded intercept announcement, to an intercept tone, or to an attendant.
 - Attendant emergency override permits the attendant to dial an administrative control access code plus the extension to override the controlled termination restriction (IWR) imposed upon a station.
- 3.02 Originating call restrictions can be used by hotels to prevent revenue loss due to unauthorized calls being placed from unoccupied room telephones by guests who have checked out, or by hotel staff. Terminating restrictions are desirable to allow a room occupant of a hotel or hospital to request that no incoming calls be completed to the room telephone.
- 3.03 For example, consider a hotel with the originating restriction feature. Initially, all of the lines are assigned to a single functional group (X). Lines in functional group X are allowed to dial any calls routing to a Traffic Service Position System (TSPS) operator would usually be provided

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for long distance telephone charges]. When a guest checks out of the hotel, the cashier moves the line to another functional group (Y). Lines in functional group Y are restricted from making outgoing calls but intracenter calls are allowed. Lines on which incoming calls are to be barred can be treated similarly. For example, at night a hospital could assign a single line or all of the lines on a floor or ward to a functional group with inward restriction. Calls to lines which are inward restricted are routed to announcement, the attendant, or reorder.

3.04 The CCSR feature can be activated from a 90A Customer Premises System (CPS) inquiry/response display station and/or selected lines (or trunks in the case of data link attendants).

A. Inquiry and Display Station

3.05 The 90A CPS consists of a 102A1-B display unit and a 79A1 control unit. An optional, commercially available, printer is available to provide a printout of the response data. (See Fig. 1.)

3.06 The 90A CPS is used by the customer to dynamically reassign any line in the multiline group from one functional group to another, thereby changing the originating and/or terminating restrictions on that line.

3.07 The customer keys in commands on the 90A CPS and receives verification through the inquiry and display station (Fig. 2). The inquiry and display station has an ON button (nonlocking) with associated ON indicator lamp, a START indicator lamp, a light emitting diode (LED) numeric display of the extension number and system response, a CLEAR indicator lamp, an OFF button (nonlocking), and a 12-button TOUCH-TONE® pad.

3.08 To operate the inquiry and display station, the customer depresses the ON button. The ON indicator lights, followed by lighting of the START indicator. The START indicator must be lighted before commands can be processed. The customer then dials the command code for the desired function. (See Table A.) Responses to keyed commands are immediate with the exception of the command for invoking a prestored package (line configuration package). This response requires a slight delay. The commands that can be keyed in and the corresponding responses received at the inquiry and display station are shown in Table B.

3.09 If the inquiry and display station remains idle after 10 seconds of START indication, the station is automatically turned off. It is recommended that the OFF button be depressed at the end of each inquiry session to avoid automatic timeout. LEDs continue to display results of the last command even after the OFF button is depressed or the 10-second timeout has occurred. After the START indicator lamp extinguishes, no commands are processed until the ON button is again depressed and the START indicator lamp lights.

3.10 If an invalid control code is dialed, all dashes (-) will appear on both numeric displays. To correct this condition, the user redials. (Dialing errors can be corrected by depressing the OFF button and then the ON button and redialing after observing the START indication.)

B. Administrative Lines with Access to Inquiry/Response Functions

3.11 An option is available to allow selected lines such as attendant lines and nurses stations to perform some of the 90A CPS functions. The following functions can be performed by these lines:

- (a) Invoke a prestored package [line configuration package (LCP)]
- (b) Move a group of lines to a new functional group
- (c) Move line to a new functional group.
- (d) Activate/deactivate intracenter inward restriction.

3.12 To use this capability, these lines (or trunks in the case of business customers with data link hardware) first dial an **access code** to convert the line to an inquiry line. Then, they dial the appropriate access code for the function desired. Upon completing the request, the user receives confirmation tone.

3.13 Incorrect dialing results in reorder tone. If the system is unable to accept a request to invoke an LCP, the user receives busy tone. The dialing formats applicable to this option are as follows:

- (a) Access Code + LCP Code + LCP Number

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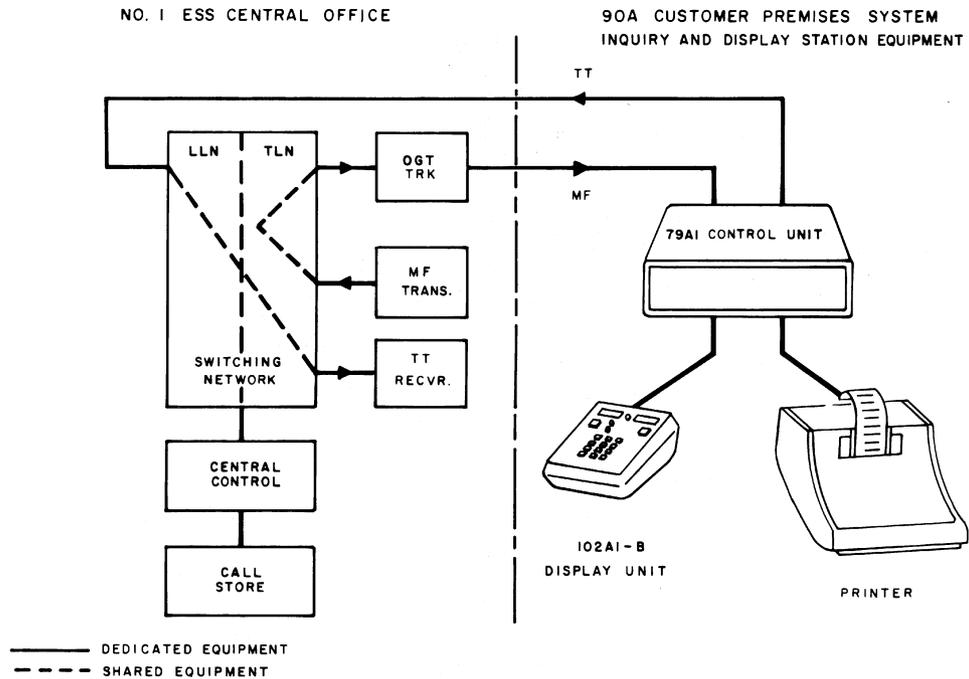


Fig. 1—ESS Central Office/90A Customer Premises System Interface

- (b) Access Code + Starting Extension Number + Move Group Identifier Code + End Extension Number
- (c) Access Code + Move Group Line Identifier Code + Extension Number
- (d) Access Code + Activate or Deactivate Intracentrex Inward Restriction (IIWR) Code.

C. Attendant Emergency Override On Extension Calls

3.14 The capability for an attendant to override the terminating restriction of an extension line is provided so that a guest/patient can be reached in an emergency. The attendant accomplishes this by dialing the emergency override control access code plus the extension number of the restricted station.

TELEPHONE COMPANY

3.15 The format for transmitting data to the 90A CPS is compatible with existing multifrequency outpulsing. (Refer to Table B.) The **key pulse (KP)** and **stop pulse (SP)** are standard MF outpulsing requirements. To minimize the number of digits which must be transmitted, the display is updated from right to left. All digit positions which are not sent are blanked unless the steering code indicates that the clear light should be lighted.

4. SYSTEM OPERATION

HARDWARE

4.01 The CCSR feature requires one or more 90A CPS display and control stations. Each station requires a 102A1-B display unit and a 79A1

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Fig. 2—102A1-B Inquiry and Display Unit

control unit. It is anticipated that one or two stations will be sufficient for most customers.

4.02 Each 90A CPS has direct interface to the No. 1/1A ESS via a LEN appearance, a TLN appearance, and an outgoing trunk circuit SD-1A192 (J1A032CB or J1A084CB) to the controller.

4.03 To communicate with the 90A CPS, the ESS office must be equipped with an MF transmitter

circuit SD-1A175 (J1A033DF) and a combined dial pulse receiver/TOUCH-TONE calling detector circuit SD-1A172/1A173 (J1A033DC/J1A033DD) or combined circuit SD-1A172/1C650 (J1A088DC/J99388C).

4.04 The TOUCH-TONE receiver is required to receive and record the extension number of access code digits. The MF transmitter is required for data outpulsing.

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TABLE A
SAMPLE DIALING PLAN FOR CCSR CUSTOMERS

DIALING CODES WHEN ONLY CCSR USED	FUNCTION (NOTE 1)
*2 *4 *5 *6t eeee *7dd *8 eeee eeee *8 eeee *9 eeee eeee *9 eeee *6# ** **2 eeee **3f **4 **6dd **9dd	Set intra-centrex inward restriction Convert line to inquiry line Reset intra-centrex inward restriction Test Move line to specified FG Move single line to FG 01† Move group of lines to FG 01 Move single line to FG 02† Move group of lines to FG 02 Turn off display Activate attendant emergency override Display line's FG number Invoke prestored LCP Display active LCP Display lines not normally assigned to specified FG Display lines in specified FG
ADDITIONAL DIALING CODES IF CCSR USED WITH SMRS-CSDA	FUNCTION (NOTES 1 AND 2)
*1eeee eeee *1eeee ***3eeee eeee *3eeee *0 **0	Read single line's message units† Read group of lines' message units Clear single line's message units† Clear group of lines' message units Clear displayed line's message units Clear displayed line's message units and move line to preprogrammed FG ††

† Block functions default to single line functions when the starting line is null.

†† The attendant does not key in a FG for the function.

Legend:

dd = Functional Group (FG) Number
 eeee = Extension Number
 f = Line Configuration Package (LCP)
 t = Test Digit

Notes:

1. The functions indicated are not necessarily mandatory. Different combinations of these functions may be selected by the customer.
2. SMRS-CSDA is an arrangement of the SMRS feature in which electronic display equipment is used. The CCSR feature can be combined with the SMRS feature only when the CSDA arrangement is used.

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TABLE B

SAMPLE INQUIRY AND DISPLAY STATION COMMANDS AND RESPONSES

EXAMPLE	DIGIT KEYPED	90A CPS RESPONSES		
		DISPLAY UNIT	PRINTER	
Read group of lines.	3111 * 1 3115	3 1 1 5	1 0	3111 3 3112 5 3113 17 3114 100 3115 10
Set IIWR feature.	* 2		1	1
Clear single line's message units.	* 3 3110	3 1 1 0	0	3110 0
Convert line to inquiry line.	* 4	- - - -	- - - -	
Reset IIWR feature.	* 5		0	0
Display digit 3 for test.	* 6 3	3 3 3 3	3 3 3	3333 333
Move line to functional group 04.	3210 * 7 04	3 2 1 0	0 4	3210 04
Move group of lines to functional group 01.	3211 * 8 3214	3 2 1 4	0 1	3211 01 3212 01 3213 01 3214 01
Move group of lines to functional group 02.	3215 * 9 3217	3 2 1 5	0 2	3215 02 3216 02 3217 02
Clear and move.	** 0	3 2 1 5 ⊗	3	3215 3X
Clear block of lines.	3111 * 3 3114	3 1 1 4	0	3111 0 3114 0
Clear CSMU.	* 0	3 1 1 4 ⊗	1 0	3114 10X
Read single line.	* 1 3298	3 2 9 8	1 5	3298 15
Move single line to functional group 01.	* 8 3299	3 2 9 9	0 1	3299 01

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TABLE B (Contd)

SAMPLE INQUIRY AND DISPLAY STATION COMMANDS AND RESPONSES

EXAMPLE	DIGIT KEYPED	90A CPS RESPONSES			
		DISPLAY UNIT		PRINTER	
Move single line to functional group 02.	* 9 3299	3 2 9 9	0 2	3299	02
Display line's functional group number.	** 2 3297	3 2 9 7	0 5	3297	05
Display active line configuration package.	** 4		5		05
Invoke prestored line configuration package 3.	** 3 3		3		3
Display lines in functional group 02.	** 9 02	3 2 1 7	0 2	3215 3216 3217	02 02 02
Display lines not normally in functional group 02.	** 6 02	3 2 9 9	0 2	3299	02

OFFICE DATA STRUCTURES

A. Translations

General

4.05 Extension lines and display station lines have basic translation requirements that are common to both. These requirements are as follows:

- (a) Both types of lines must be assigned to the same nonhunt multiline group (and therefore use the same nonhunt multiline group common block). A nonhunt multiline group is identified by having a multiline hunt type of 3.
- (b) Both types of lines must be assigned to a centrex group (and therefore use the centrex common block and digit interpreter tables). The centrex group is usually the same for both types of lines.
- (c) Both types of lines require multiline group terminal numbers. Low terminal numbers (TERM) are reserved for display station lines. Display station lines must be assigned consecutively starting with TERM 1. The first TERM number which can be assigned to guest or patient lines is two times the number of TERMS reserved

for display station lines. This method permits a small customer to have one display station and a large customer to have any number of display stations (up to 15). The extension numbers (directory numbers) must be assigned in numeric order (via RC:LINE messages) so that the extension number associated with the terminal (i) + 1 is greater than the extension number associated with terminal (i). An example is:

EXTENSION	TERM NUMBER
2100	41
2101	42
2102	43
2103	44
2104	45
2200	46
2201	47

It is not necessary to initially equip all of the TERMS which are reserved for the display station

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lines. Normally, a customer will require only one data group.

Line Equipment Number Translations

4.06 *Extension lines* must have the special line (SL) bit set to 1 in their LENCL 1 word. The call store data (CSDA) bit in the LENCL 3 word must equal 1. A centrex group number (CTXN) must be specified so that the originating line has centrex group features and dial access capabilities. The centrex access treatment (CAT) code in the LENCL 2 word is used to allow access to the display features by the display station line(s) and to deny access by the other stations. The originating major class (OMAJ) must equal 31 for a 90A CPS inquiry and display station. The LEN translations may be either abbreviated or auxiliary block format.

4.07 The *display station line* must also have the SL bit set to 1 in its LENCL 1 word. The CSDA bit in the LENCL 3 word must equal 1. In addition, the CAT code in the LENCL 2 word must be assigned so as to allow the display station dial access to the CCSR service codes. The display station line must also have an originating major class of 31 in the LENCL 1 word. Refer to Fig. 3 for the LEN transition layout.

Directory Number Translations

4.08 Extension line and display station line directory number translation data can be either abbreviated or auxiliary block format. If the abbreviated format is used, the originating line's multiline group number and terminal number are in a DN subtranslator word. If the auxiliary block is used, the multiline group number and terminal number are located in word 0 of a DN auxiliary block, DNCL 1 data is located in word 1, and DNCL 2 data is located in word 2. If the abbreviated method is used, the calling line's DN translation data (DNCL 1 and 2) is located in the multiline common block. If a DN auxiliary block is used, the call store data (CSDA) bit must be set to 0 in the DNCL 2 word. The terminating major class for a 90A CPS must be centrex no direct inward dialing (TMAJ = 16). Refer to Fig. 4 for the DN translation layout.

Centrex Group Translations

4.09 The customer's centrex group translations consist of the centrex common block and associated centrex digit interpreter tables. These tables provide the common business customer group features and dial access features such as extension dialing (DTYP 2), dial "9" (DTYP 4), and 1-digit dialing for housekeeping, restaurant, manager, and attendant (DTYP 6). The DTYP 5 final data (Fig. 5, 6, and 7), used by the inquiry and display stations, must be denied to guest *extension lines*. This restriction is accomplished with the CAT restriction bits in the DTYP 5 words. Centrex lines should be blocked from dialing the 90A CPS extension(s). This can be accomplished by screening the extension digit(s) in the centrex digit interpreter tables.

4.10 Word 26 in the customer's centrex common block also contains the route index of the *inquiry and display station's* trunk group (Fig. 8). The trunks in this trunk group must be arranged so that the member number of the trunk associated with station (i) is the same as the MLHG TERM number of the line associated with station (i).

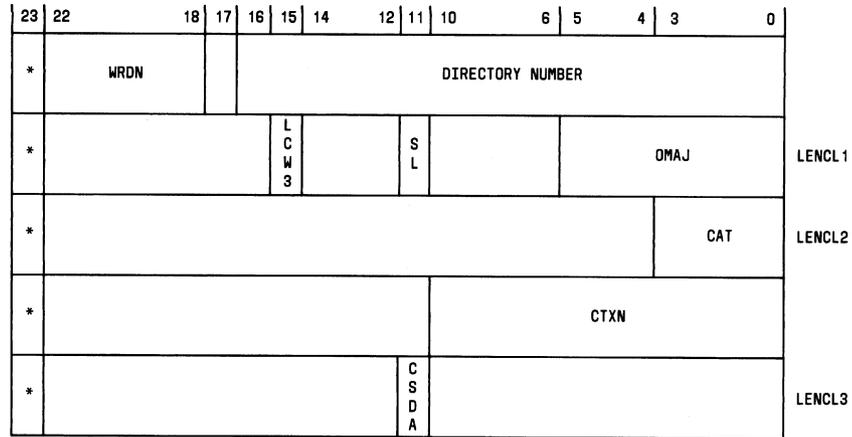
4.11 The centrex common block also provides entry (first level digit interpreter table) into the digit interpreter tables for special display station commands. (See Fig. 5.) Access to the DTYP 5 final data by the display station line is provided by having the restriction bit corresponding to this line's CAT group set to 1. The emergency override on extension calls is DTYP 5, subtype 18, sub-subtype 11.

Multiline Group Translations

4.12 The multiline group common block of the *extension lines and display station lines* (Fig. 9) must have the special line (SL) bit set to 1 in the DNCL 1 word. The CSDA bit in the DNCL 2 word must be set to 1 indicating the Call Store Data Accumulation feature. In the LENCL 3 word, the multiline hunt type (TYPE) item must equal 3, indicating that this common block is for a nonhunting multiline group. The CSDA bit in the LENCL 3 word must also be set to 1. Word 4 of the multiline group common block must contain the address of the LEN list head table (also called the hunting list head table). Word 14 of the multiline group common block contains

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* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:

- CAT - CENTREX ACCESS TREATMENT CODE
- CSDA - CALL STORE DATA ACCUMULATOR = 1
- CTXN - CENTREX GROUP NUMBER
- LCW3 - LEN CLASS 3 WORD REQUIRED = 1
- OMAJ - ORIGINATING MAJOR CLASS = 31 FOR INQUIRY AND DISPLAY STATION; REGULAR ENTRY FOR OTHER LINES
- SL - SPECIAL LINE = 1

NOTE:

LEN TRANSLATIONS MAY BE ABBREVIATED

Fig. 3—LEN Auxiliary Block for CCSR Feature

the number of functional groups (NOS) item for the CCSR customer. Word 15 of this common block contains the DAG number item and the number of display stations (NDS) item. The OWR bit, the IWR bit, the IIWR bit, and the SRG bit (indicating that the multiline group has a DAG with mask blocks) must be set to indicate which restriction features apply.

Data Group and Mask Block Translations

4.13 The purpose of the DAG and mask block translators (Fig. 10 and 11 respectively) is to obtain the PS backup for a particular CS mask block given the DAG number, the functional group number, and the LCP number. The functional group mask block defines the originating and/or terminating call restrictions applicable to the group.

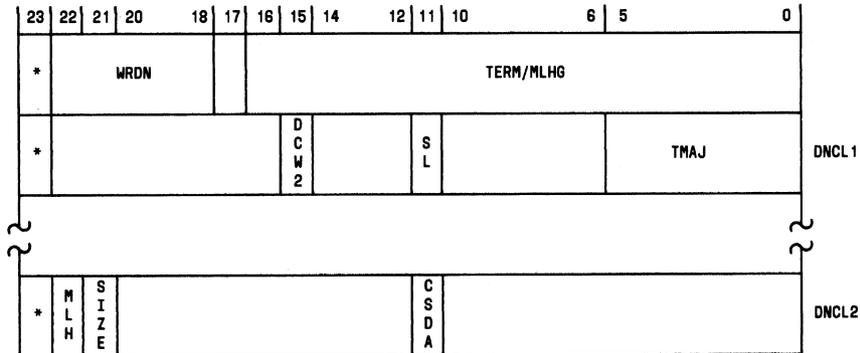
Word 1 of the mask block translator auxiliary block contains the restriction bits applying to a particular functional group. The inward restriction type (IWR) bit is set to 1 if calls to the line are to be treated as if the line was made busy by a scan point. The outward restriction type (OWRT) item is set to 1 if all dial "8" and "9" calls are to be routed to reorder. This item is set to 2 if all originations are to be treated as if the line was a centrex manual line and is set to 3 if all originations are to be treated as if the line was a centrex denied origination line.

Trunk Translations

4.14 The trunk class code expansion for the display station trunk circuit SD-1A192-02 or

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* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

- LEGEND:**
 CSDA - CALL STORE DATA ACCUMULATOR = 0
 DCW2 - DN CLASS 2 WORD REQUIRED = 1
 MLH - MULTILINE HUNT = 0
 SL - SPECIAL LINE = 1
 TMAJ - TERMINATING MAJOR CLASS = 16 FOR INQUIRY AND DISPLAY STATION; REGULAR ENTRY FOR OTHER LINES
 SIZE - EQUALS 0 FOR MLHG FROM 0-63
NOTE:
 DN TRANSLATIONS MAY BE ABBREVIATED

Fig. 4—DN Auxiliary Block for CCSR Feature

SD-1A192-05 is shown in Fig. 12. The supervisory program index (SPI) is 15.

4.15 The route index expansion table (obtained via the centrex group translator) points to the trunk group number (TGN) auxiliary block (Fig. 13). All TNNs must be listed in the TGN auxiliary block. The TGN auxiliary block is indexed by the MLHG terminal number to obtain the TNN. The TNN is used to outpulse the data to the display station.

4.16 Each TNN requires a TNN-to-TGN auxiliary block (Fig. 14). Member No. 1 and TNN 1 are assigned to display station No. 1; member No. 2 and TNN 2 are assigned to display station No. 2, etc. The member number for a particular display station must equal the MLHG terminal number for the line associated with that station.

B. Parameters/Call Store

4.17 Two parameter words, H8DAG and H8MRCC, are required to provide the CCSR feature. (See Fig. 15 and 16.)

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23	22	20	19		12	11	10	9		5	4	0	
*	DTYP	RESTR						SSTYP	STYP				

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO FOR NO. 1A ESS.

LEGEND:
 DTYP - DATATYPE = 5
 RESTR - TREATMENT CODE
 †SSTYP - SUB-SUBTYPE
 STYP - SUBTYPE = 18

†SSTYP	COMMAND DESCRIPTION	SSTYP	COMMAND DESCRIPTION
5	ZERO CALL STORE MESSAGE UNITS	16	DISPLAY ACTIVE LCP
6	ZERO BLOCK OF CALL STORE MESSAGE UNITS	23	DISPLAY CALL STORE MESSAGE UNITS OF SPECIFIED LINE
7	PRINT BLOCK OF CALL STORE MESSAGE UNITS	24	MOVE A SEQUENTIAL GROUP OF LINES TO SPECIFIED FUNCTIONAL GROUP
8	VERIFY TEST DIGITS ON NUMERIC LEDs		
11	ACTIVATE ATTENDANT EMERGENCY OVERRIDE	25	ZERO CALL STORE MESSAGE UNITS AND MOVE SINGLE LINE TO SPECIFIED FUNCTIONAL GROUP
12	MOVE LINE IN MLG TO SPECIFIED FUNCTIONAL GROUP		
13	DISPLAY LINES IN SPECIFIED FUNCTIONAL GROUP	26	ACTIVATE IIWR (ACT = 1) DEACTIVATE IIWR (ACT = 0)
14	DISPLAY FUNCTIONAL GROUP ASSIGNMENT OF SPECIFIED LINE	27	DISPLAY LINES NOT NORMALLY ASSIGNED TO SPECIFIED FUNCTIONAL GROUP
15	INVOKE SPECIFIED PRESTORED LCP	28	CONVERT LINE TO INQUIRY LINE

Fig. 5—Centrex Digit Interpreter Table Word, DTYP = 5 and STYP = 18

23	22	20	19	18	17		12	11	10	9		5	4	0	
*	WRDN				0								0	FG	
*	DTYP	RESTR						00	SSTYP	STYP					

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO FOR NO. 1A ESS.

LEGEND:
 DTYP - DATATYPE = 5
 FG - FUNCTIONAL GROUP NUMBER. APPLICABLE ONLY TO SSTYPs 24, 25 OF STYP 18.
 RESTR - TREATMENT CODE
 SSTYP - SUB-SUBTYPE = 24, 25
 STYP - SUBTYPE = 18

Fig. 6—Digit Interpreter Auxiliary Block for Functional Group Numbers Associated With STYP = 18 and SSTYP = 24, 25

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23	22	20	19	18	17	12	11	10	9	5	4	1	0	
*		WRDN			0								A C T	
*		DTYP			RESTR			SSTYP			STYP			

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO FOR NO. 1A ESS.

LEGEND:
 ACT - ACTIVATE "INTRA-CENTREX INWARD RESTRICTION"
 DTYP - DATATYPE = 5
 RESTR - TREATMENT CODE
 SSTYP - SUB-SUBTYPE = 26
 STYP - SUBTYPE = 18

Fig. 7—Digit Interpreter Auxiliary Block for Intra-Centrex Inward Restriction When STYP = 18 and SSTYPE = 26

23	22	16	15	5	4	0
WORD 26 *		ROUTE INDEX OF DISPLAY STATION TRUNK GROUP				

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO FOR NO. 1A ESS

Fig. 8—Centrex Common Block—Word 26

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23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	0	
*		WRDN				NOGR						INDEX				WORD 0	
*								LCW ₃				SL					WORD 1 (LENCL 1)
*																WORD 2 (LENCL 2)	
*								DCW ₂				SL					WORD 3 (DNCL 1)
*		ADDRESS OF HUNT LIST HEAD TABLE														WORD 4	
~																WORDS 5 THRU 9	
*		ML _H	SZ	TYPE								CSDA					WORD 10 (LENCL 3)
*		ML _H	SZ	TYPE								CSDA					WORD 11 (DNCL 2)
~																WORDS 12 AND 13	
*		NOS														WORD 14	
*		CSMU	SRG	AUC	IP _E G	TKUC	IWR	IWR	OWR	NDS			DAG				WORD 15

* BIT 23 DOES NOT EXIST IN TRANSLATION
 WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO
 FOR NO. 1A ESS.

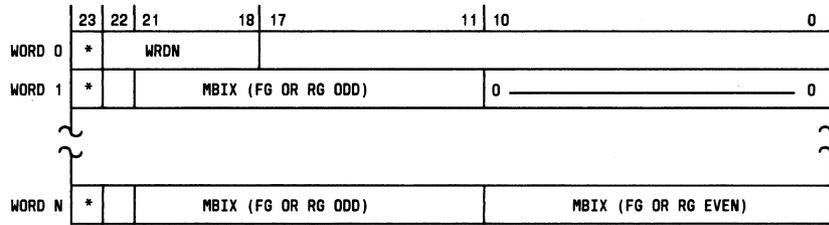
LEGEND:

- | | |
|--|---|
| <p>AUC - AGENT USAGE COUNTS = 0
 CSDA - CALL STORE DATA ACCUMULATOR = 1
 CSMU - CALL STORE MESSAGE UNIT ACCUMULATOR
 (OPTIONAL FOR CCSR FEATURE)
 DAG - DATA ACCUMULATION GROUP
 DCW2 - DN CLASS 2 WORD REQUIRED = 1
 IIWR - INTRA-CENTREX INWARD RESTRICTION
 IPEG - INCOMING CALL PEG COUNTS = 0
 IWR - INWARD RESTRICTION
 LCW3 - LEN CLASS 3 WORD REQUIRED = 1
 MLH - MULTILINE HUNT = 0</p> | <p>NDS - NUMBER OF DISPLAY STATIONS
 NOGR - NUMBER GROUP NUMBER
 NOS - NUMBER OF FUNCTIONAL GROUPS
 OWR - OUTWARD RESTRICTION
 SL - SPECIAL LINE = 1
 SRG - FUNCTIONAL GROUPS = 1 WHEN "NOS" OF
 WORD 14 IS GREATER THAN ZERO
 SZ - SIZE = 1 FOR MLG NUMBER 0-63;
 = 0 FOR ALL OTHERS
 TKUC - AGENT TROUBLE KEY USAGE COUNTS = 0
 TYPE - MULTILINE HUNT TYPE = 3 FOR NONHUNTING</p> |
|--|---|

Fig. 9—Multiline Group (Nonhunting) Common Block for CCSR Feature

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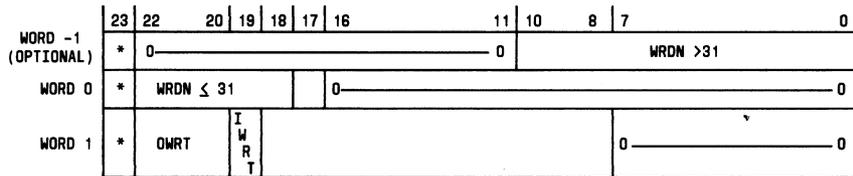
WHERE $2 \leq N \leq 16$

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO FOR NO. 1A ESS.

LEGEND:
MBIX - MASK BLOCK INDEX

NOTE:
IF THE MASK BLOCK INDEX (MBIX) RELATES TO AN EVEN NUMBERED FUNCTIONAL GROUP OR REPORTING GROUP THEN IT WILL APPEAR IN BITS 0-10. IF THE MBIX RELATES TO AN ODD NUMBERED GROUP IT WILL APPEAR IN BITS 11-21. THE MBIX WILL BE IN WORD 1+ RPG NO./2 OR 1+ FG NO./2.

Fig. 10—DAG Auxiliary Block Words



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO IN NO. 1A ESS.

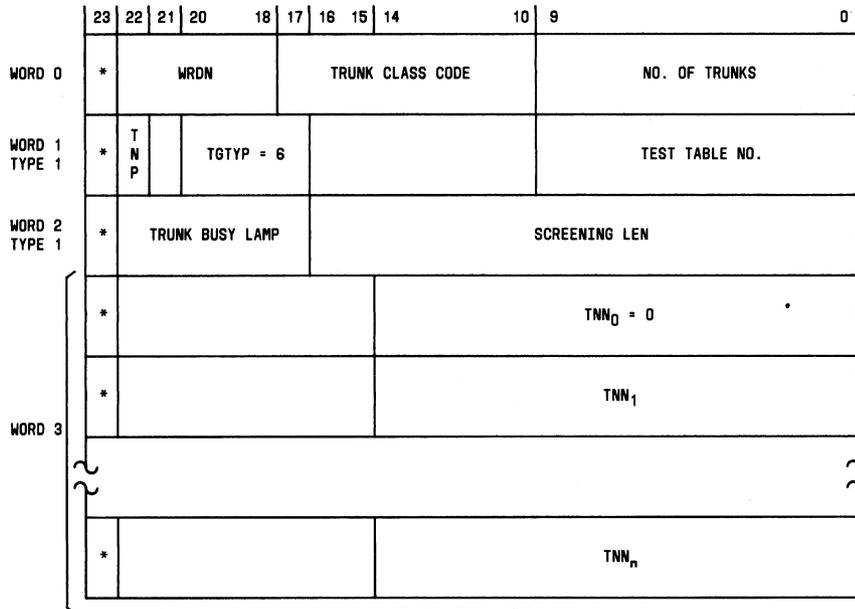
LEGEND:
IWRT - INWARD RESTRICTION
OWRT - OUTWARD RESTRICTION

NOTE:
THE SUPERVISORY DN ITEM IN WORD 0 (BITS 0-16) AND THE QUEUE NUMBER ITEM IN WORD 1 (BITS 0-7) ARE NOT USED FOR THE CCSR FEATURE

Fig. 11—Mask Block Auxiliary Block Words

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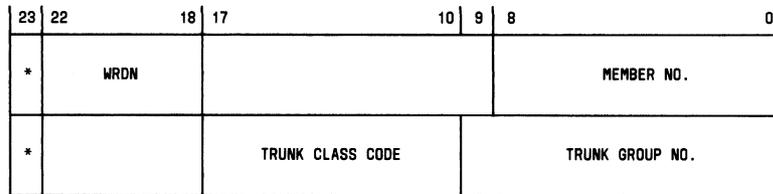
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* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
 TGYP - TRUNK GROUP TYPE
 TNN - TRUNK NETWORK NUMBER
 TNP - TOLL NETWORK PROTECTION

Fig. 13—Trunk Group Number Auxiliary Block



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

Fig. 14—Trunk Network Number to Trunk Group Number Auxiliary Block

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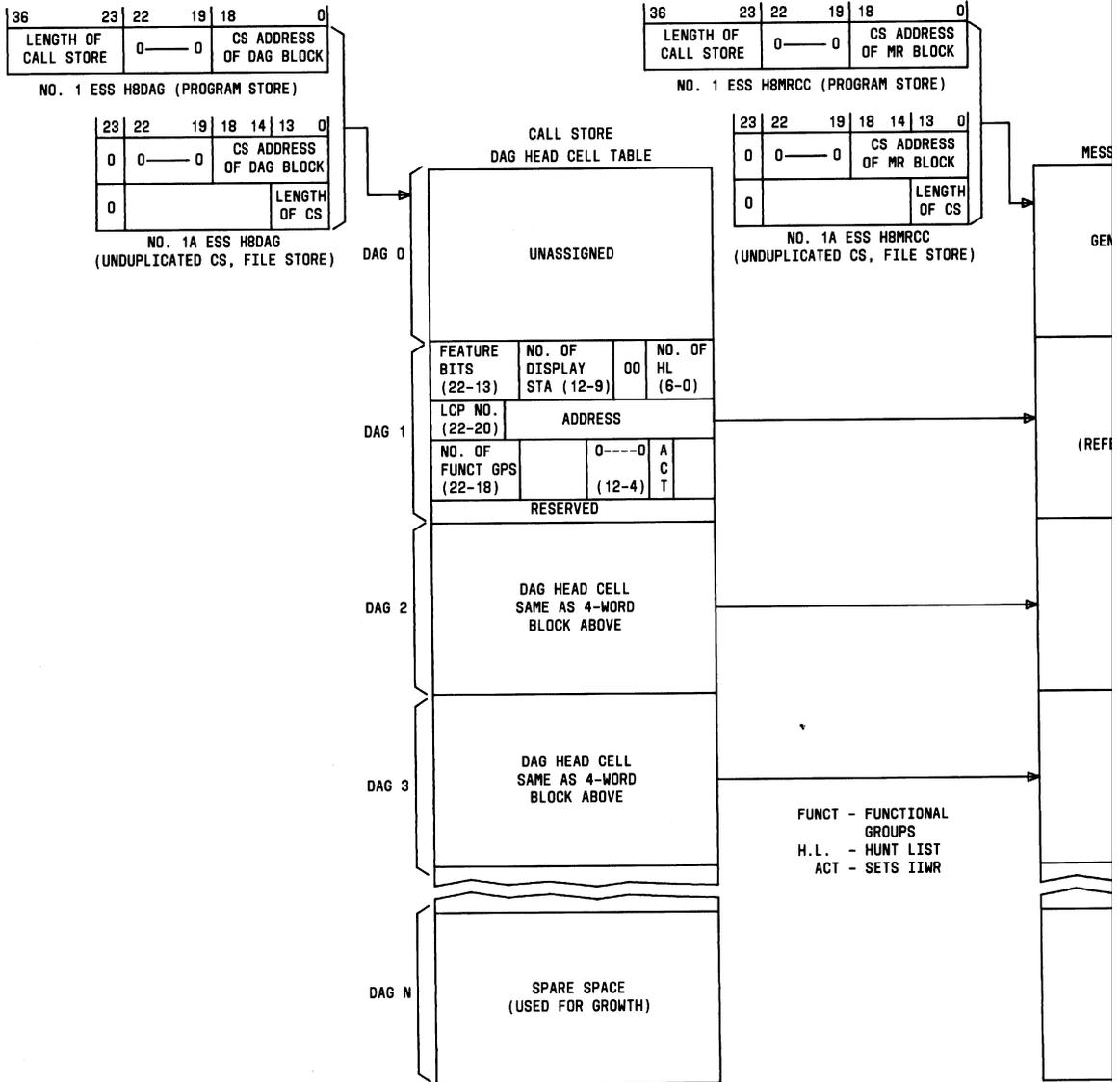


Fig. 15—Data Accumulation and Call Store Lay

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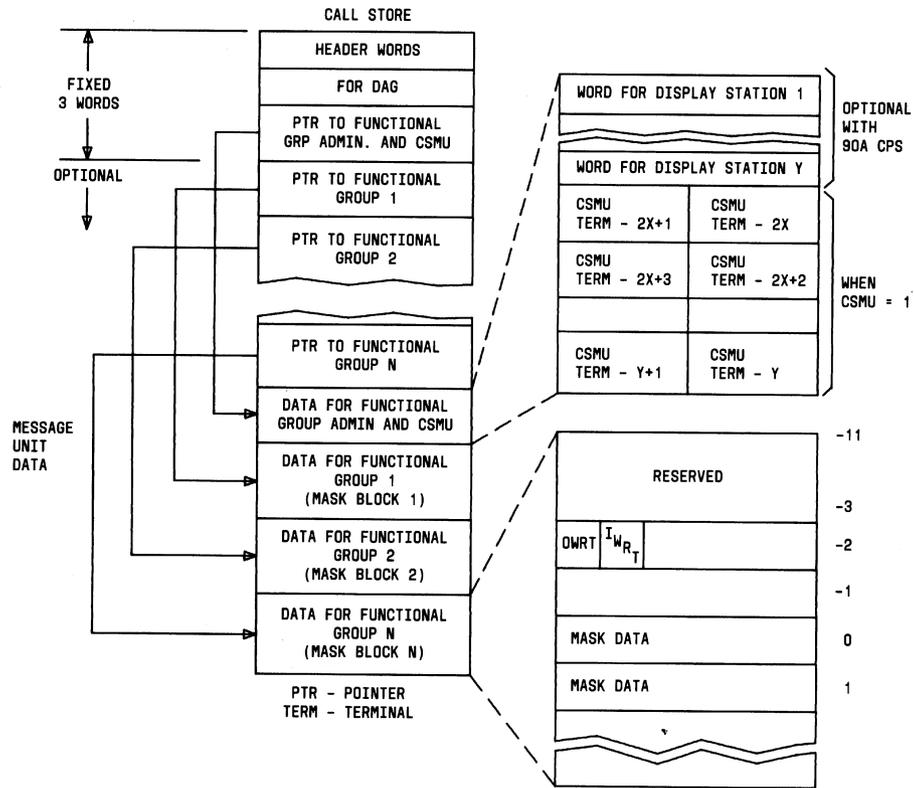


Fig. 16—Data Layout for Call Store Message Register Blocks

4.18 In No. 1 ESS, program store parameter word location H8DAG contains the starting address and the length of the data accumulation group head cell table.

4.19 Program store parameter word location H8MRCC contains the starting address and the length of the message register and cashier console (MRCC) block.

4.20 In No. 1A ESS, H8DAG and H8MRCC are each 2-word blocks in unduplicated call store. Each block contains the relating starting address

in the first word and the length data in the second word.

FEATURE OPERATION

A. Extension Lines

4.21 Upon origination of a call from an extension line, a line equipment number (LEN) translation is performed for that calling line. The LEN translation identifies the originating line's directory number (DN); the LENCL 1, LENCL 2, and LENCL 3 words; centrex group number; and generic and optional data from a LEN auxiliary block or

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abbreviated centrex words. The LENCL 1 word is checked to see if the special line (SL) bit is set to 1. (If SL bit = 0, normal call processing is continued.) The LENCL 3 word is checked to see if the call store data (CSDA) bit is set to 1. (If the CSDA bit = 0, the CCSR feature is not indicated.) The LENCL 1 word is also checked to see which major originating class is assigned to the calling line. The line is treated as an extension line unless a major originating class of 31 (data access line) is detected. The LEN translation also yields the centrex group number (CTXN) of the originating line.

4.22 An originating register (OR) is seized for the extension line, and dialed digits are collected. The CTXN is then used to locate the centrex group common block of the originating line. The centrex common block provides business customer features accessible by the line.

4.23 The originating line's DN, derived from the LEN translation, is used by the system to perform a DN translation. This translation yields a multiline group (MLG) number and terminal number (TERM) for that line. The MLG number, derived from the DN translation, indexes into the MLG head table to select the originating line's MLG common block. The MLG common block provides a data group (DAG) number. Each line in the same DAG, as specified by the DAG number, has a unique member number, the MLG terminal number.

4.24 The outward restriction (OWR) bit in the originating line's MLG common block is checked to determine if the originating call restriction is applicable to the MLG. If OWR bit = 1, a search routine determines the current functional group assignment of the originating line. The call is then handled as prescribed by the originating restriction bits in the mask block associated with the functional group.

4.25 There are three variations of originating call restrictions. The first variation allows intragroup calls and routes dial "8" and dial "9" calls (centrex data type 4 only) to reorder. The second treats all originations as centrex manual or hot lines. The call is routed as follows:

- (a) If the line has individual speed calling, the call is routed to the first entry (2) in the 1-digit speed call list (hot line).

- (b) If the line has group speed calling, the call is routed to the first entry in 2-digit speed call list (hot line).

- (c) If neither type of speed calling is provided, the call is routed as a dial 0 call (manual originating line).

The third variation prohibits all originations (centrex denied origination line treatment). Implementation of this scheme requires up to eight functional groups if a particular customer desires all combinations of restrictions.

4.26 When an incoming call is made to an extension DN, the system performs a DN translation on this DN. The DN translation yields the customer's MLG number and the functional group number of the called extension. The system locates the MLG common block using the MLG number derived in the DN translation.

4.27 The inward restriction bits in the MLG common block are checked to determine if the inward restriction (IWR) and/or intracentrex inward restriction (IIWR) apply to this MLG. If the IWR and/or IIWR bits equal 1, a search routine determines the current functional group to which the terminating line belongs. If the restriction bits in the mask block for that functional group indicate that terminating calls are restricted, the call is routed to the call forward busy line DN in the MLG common block (if IWR applies) or to centrex common intercept (RI 150) (if IIWR applies). If both restrictions are active, IWR takes precedence.

4.28 The mask block concept uses a block of call store (CS), referred to as a functional group assignment block or functional group mask block. This block has a bit layout parallel to the MLG activity block with each bit corresponding to a particular terminal in the MLG.

4.29 At least two functional groups are required by a CCSR customer. Although the information provided by these two functional groups seems somewhat redundant, this redundancy is necessary to facilitate auditing the functional groups. Using this scheme, the premise that a line can be assigned to only one functional group at any given time is maintained.

B. Inquiry and Display Station Lines

4.30 When the display station is turned on, an off-hook is generated on its inquiry line. The ESS detects an origination on the inquiry line, which has a special originating major class of 31, and performs a LEN translation for that calling line. The LEN translation identifies the DN of the calling line; the LENCL 1, LENCL 2, and LENCL 3 words; centrex group number; and other generic and optional data from a LEN auxiliary block or abbreviated centrex words. The LENCL 1 word is checked to see if the SL bit is set to 1. The LENCL 3 word is checked to see if the CSDA bit is set to 1. The LENCL 1 word is also checked to see what major originating class is assigned to the calling line. The major originating class of 31, which is assigned to all display station lines, allows special handling of the display station call. The LEN translation also provides a CTXN so that the originating line has access to the customer's centrex common block and digit interpreter tables.

4.31 Word 26 of the centrex common block contains the route index of the display station trunk group. This route index translates into a trunk group associated with this particular display station. A response trunk is selected through standard trunk group translations. The centrex common block also provides entry into the digit interpreter tables for access to display station command codes via the DTYP 5 restriction bits and the LENCL 2 CAT code.

4.32 An OR is initialized, dial tone is returned to the display station line, and a special client transfer address is set up for digit collection. The latter action indicates that all digits dialed from these lines are routed through the inquiry-response program. The dial tone causes the START lamp to light on the display station. When a digit is collected, the digit analysis program transfers to the digit analysis address in the inquiry-response program. The inquiry-response program calls the centrex digit interpreter routines. When the translation indicates that final data has been dialed, the applicable inquiry-response analysis routine is called to process the data.

4.33 After the data has been processed, the response trunk is connected to a multifrequency transmitter (Fig. 1) and an appropriate message is

signaled to the 90A CPS display station. Dial tone is then returned to the 90A CPS.

4.34 When a line configuration package (LCP) is invoked, all of the lines are moved to their base functional group. The program store backup for the functional groups also contains the backup data for the functional group characteristics (see paragraphs 4.25 and 4.26). Each functional group has an inward restriction type and an outward restriction type. Either or both types may be zero. This indicates that the lines associated with this functional group do not have that type of restriction. When a line is moved from one functional group to another functional group, the line receives the restriction characteristics associated with that functional group.

4.35 The CCSR customer can invoke an LCP by keying in the appropriate code on the 90A CPS display unit. The system collects digits keyed at the display unit and interprets them through the customer's digit interpreter tables. The LCP number collected is written into the second word of the data accumulation group head cell table associated with the customer's MLG. The recently updated LCP number identifies the package presently in effect.

4.36 Each set of PS mask blocks is assigned an LCP number, 0 to 7. The system uses the LCP number to index into the data group (DAG) translator. The DAG subtranslator entry points to an auxiliary block which contains a mask block index (MBI). The MBI is used to access the mask block translator which contains backup copies of the line configuration packages.

4.37 The system uses the MBI to access the mask block translator in PS. The mask block translator contains backup copies of the functional group packages.

4.38 The mask block data is then copied from its PS location into the H8MRCC CS data area. This CS area acts as an overlay or mask block for the MLG common block. Once the functional group assignment data is written into CS, it can be modified from the 90A CPS display unit or any allowed station.

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C. Administrative Lines with Access to Inquiry/Response Functions

4.39 These lines can originate and receive calls as normal business customer lines. When a line is converted to an inquiry line, an access code is dialed which yields a sub-subtype (SSTYP) 28 of subtype (STYP) 18, data type (DTYP) 5. This access code causes the line to be treated similarly to a 90A CPS inquiry line. The OR is initialized to an inquiry line by changing the digit analysis address to the inquiry/response program and saving the DAG number given by the access code. The inquiry/response program calls the centrex digit interpreter routines. When the translation indicates that final data has been dialed, the applicable inquiry/response analysis routine is called to process the data.

4.40 After the data has been processed, confirmation tone is returned to the caller. (Reorder tone is returned if the inquiry is invalid.) The connection is then abandoned.

4.41 If the system is checking the validity of the mask block data (auditing is active), it is unable to accept a request to invoke an LCP and returns busy tone to the caller.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The CCSR feature is provided on a per multiline nonhunt group basis.

6. LIMITATIONS

OPERATIONAL

6.01 Only display stations and certain administrative lines are allowed access to the CCSR service codes. This restriction is defined by the CAT restriction bits (12 through 19) in the DTYP 5 word at the centrex digit interpreter table.

ASSIGNMENT

6.02 Each customer requires one line configuration package (LCP). Optionally, a customer may have a maximum of eight LCPs. Each LCP defines a base configuration for all of the customer's guest or patient lines. LCPs are provided on a multiline group (MLG) basis. Each LCP in that MLG must

have the same number of functional groups. Any one line in the MLG must be assigned to one, and only one, functional group at any one time. When an LCP is invoked, that LCP is activated for all functional groups in the MLG.

6.03 A CCSR customer can have up to eight functional groups. However, it is expected that most customers will require only four—one with no restrictions, one with inward restriction, one with outward restriction, and one with both inward and outward restrictions.

6.04 The CCSR customer can have up to fifteen 90A CPSs.

6.05 Where multiple display consoles are used, terminal number 1 in the MLG and member number 1 of the trunk group must be wired to the first 90A CPS. Likewise, terminal number 2 and member number 2 must be wired to the second 90A CPS, etc.

6.06 A maximum of 2031 guest/patient lines or any combination of 90A CPS display stations and guest/patient lines are allowed in one DAG. A single DAG cannot be assigned to more than one customer.

6.07 A central office can have a maximum of 63 DAGs.

6.08 Only one call forward DN and one set of busy options can be selected per MLG.

7. INTERACTIONS

STATIC

7.01 Not applicable.

DYNAMIC

7.02 Where a customer has both the CCSR feature and the Hotel-Motel Register (SMRS-CSDA) feature arrangement, the 90A CPS and MLG translations are common to both.

7.03 If the CCSR feature is provided to the customer with the SMRS-CSDA feature, additional dialing code capabilities are included without changing the existing CCSR dialing plan in order to accommodate the added feature.

7.04 If the 50A CPS console is used by the customer, the split key must be strapped to use the # digit if the CCSR access codes use the * digit as the prefix. (The split key can be strapped to either the # or * keys on the 50A-CPS console, but it is normally strapped to the * key.)

7.05 Access codes for the CCSR feature must not conflict with those for the Single Digit Dialing feature. Variable digit dialing, as allowed by the Single Digit Dialing feature, may not be used for the CCSR service codes (*1, *2, *3, *4, etc.).

8. RESTRICTION CAPABILITY

8.01 Not applicable.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 Refer to Fig. 17 for an illustration concerning the addition of the CCSR feature.

9.02 The following set cards are required for or affected by the CCSR feature:

Set Card	Title
9SIREs	Inquiry Response/Hotel Motel
DAG	Data Accumulation Groups
AMLDAg	CS Words For ACD DAg
HMCC	Hotel Motel Cashier Consoles
HMRMU	Hotel Motel Room Pairs.

9.03 Refer to Part 13 for testing procedures concerning the CCSR feature.

10. HARDWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

10.01 Each 90A CPS interfaces with the No. 1 or No. 1A ESS via a LEN appearance, a TLN appearance, and an outgoing trunk circuit SD-1A192-02 or SD-1A192-05 (trunk order code 01340 or 01300, respectively) (see Fig. 1).

10.02 There are two circuits per unit. Each circuit has two scan points and three SD points.

10.03 Trunk circuit SD-1A192-02 is mounted on the universal trunk frame. The miniaturized trunk circuit SD-1A192-05 is mounted on the miniaturized universal trunk frame.

10.04 To communicate with the 90A CPS, the ESS office must be equipped with an MF transmitter circuit SD-1A175-01 (trunk order code 06670) and a combined customer dial pulse receiver/TOUCH-TONE calling detector circuit SD-1A172-01/1A173-01 (trunk order code 06470). Effective with the No. 1 ESS 1E4 and No. 1A ESS 1AE4 generic programs, the miniaturized combined circuit SD-1A172-05/1C650-01 (trunk order code 06401) may be used.

10.05 For determination of quantities of service circuits and trunks, see references A(12) and A(13) in Part 18 for No. 1 ESS or A(17) and A(18) for No. 1A ESS.

10.06 Electronic display equipment consists of one 90A CPS for approximately each 500 extensions, depending upon traffic.

11. SOFTWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

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MEMORY

A. No. 1 ESS

Fixed

11.01 The following memory is required whether or not the feature is used:

- **Generic Program Base (program store):** approximately 50 words.
- **Parameters (program store):** two words, which are shared with the Station Message Register Service and ACD features—H8DAG and H8MRCC.

Conditional

11.02 The following memory is required only when the CCSR feature is activated:

- **Generic Program (program store):** approximately 4600 words. This cost is to be shared with other features using the IRES feature group (set card 9 SIRES).
- **Call Store:**
 - (1) Data accumulation group (DAGP) head cell table = $2 * DAG + (4 * MARK (DAG) + 2 * DAG) * 9GACD 1$, where DAG is a set card specifying the highest data link group member number to be assigned in translations. DAGs are assigned one per one thousand room pairs. **Care must be taken that there is a compatible relationship among set card DAG, the 1500A translation head table entry 30, and the actual assignment in translations.**
 - (2) Message register and cashier console (MRCC) block = $HMCC + HMRMU + AMLDAG + 5 * MARK (HMCC + HMRMU + AMLDAG)$, where HMCC, HMRMU, and AMLDAG are set cards with the following functions:
 - (a) HMCC—Specifies the number of hotel/motel cashier consoles (90A CPS inquiry and display consoles).

(b) HMRMU—Specifies the number of hotel/motel room pairs. Provide a minimum spare of four times the number of DAGs required.

(c) ALMDAG—Specifies the number of CCSR functional groups (FGs), the number of multiline groups (MLFGs), and the number of 90A CPS consoles assigned per MLG.

Variable

11.03 The following memory is required when the feature is applied:

- **Translation (program store):**

- (1) DN translation for each terminal (if not abbreviated) = 4 words.
- (2) LEN translation for each terminal (if not abbreviated) = 7 words.
- (3) MLG common block per customer = 16 words.
- (4) Centrex common block per customer = 31 words.
- (5) Number of second level digit interpreter tables depends upon access codes chosen; usually is one (16 words).
- (6) DAG translator = $18 + (1/2 \text{ word/functional group}) * (\text{number of LCPs})$.
- (7) Mask block translator = $[\text{number of functional groups} + (2 + \text{number of terminals}/16) * (\text{number of functional groups})] * [\text{number of LCPs}]$.

B. No. 1A ESS

Fixed

11.04 The following memory is required whether or not the feature is used in the CO:

- **Generic Program Base (program store, file store):** approximately 65 words.

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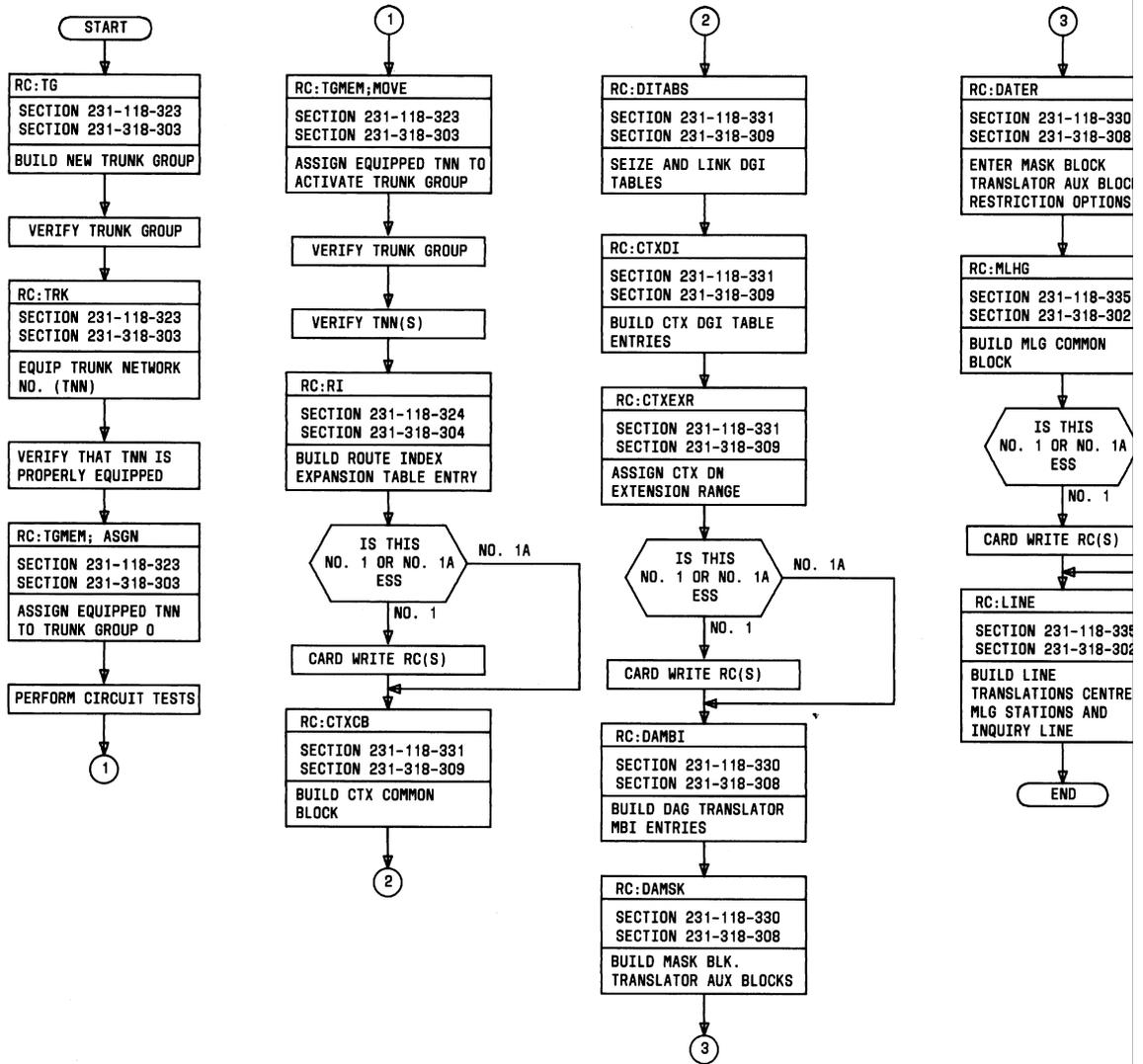


Fig. 17—Procedure for Adding the

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- **Parameters (unduplicated call store, file store):** four words which are shared with the Station Message Register Service features—H8DAG and H8MRCC.

Conditional

11.05 The following memory is required only when the CCSR feature is activated:

- **Generic Program (program store, file store):** approximately 5800 words. This cost is to be shared with other features using the IRES feature group.
- **Call Store:** Refer to paragraph 11.02.

Variable

11.06 Refer to paragraph 11.03.

REAL TIME IMPACT

11.07 In No. 1 ESS, an originating call from a line with the CCSR feature requires 225 cycles more than an origination from a line without CCSR or electronic message registers. Each terminating call also requires 225 cycles more than a call to a line without CCSR.

11.08 In No. 1A ESS, an originating call from a line with the CCSR feature requires 450 cycles more than an origination from a line without CCSR. Each terminating call also requires 450 cycles more than a call to a line without CCSR.

11.09 Refer to Table C for more detailed information concerning processor time for No. 1 and No. 1A ESS.

11.10 The cycle time in No. 1 ESS is 5.5 μ sec. The cycle time in No. 1A ESS is 0.7 μ sec.

12. DATA ASSIGNMENTS AND RECORDS

TRANSLATION FORMS

12.01 The following ESS translation forms, found in reference C(1) in Part 18, are applicable to the CCSR feature:

- (a) ESS 1101—Directory Number Record—is used to identify the DNs belonging to the customer's centrex group.

- (b) ESS 1107—Supplementary Information Record—is used to maintain a record of the data group and functional group assignments of the CCSR customer.

- (c) ESS 1109—Centrex Group Record—provides records of the customer's centrex features and access codes.

- (d) ESS 1114—Mask Block Index Record—is used to assign each line to its base functional group and provides the data used to build the program store backup for the call store functional groups.

- (e) ESS 1115—Multiline Group Record—is used to maintain records concerning the multiline group.

RECENT CHANGES

12.02 *Recent change (RC)* message formats affected by the CCSR feature are as follows:

RC Messages	Function
RC:CTXCB	Builds CTX common block data including data display route index via keyword DDRI.
RC:CTXDI	Builds digit interpreter table entries for inquiry and display station access codes (*0, *1, *3, *4, etc.), makes functional group assignment for extension lines via keyword FG, and provides means to activate and deactivate intracentrex inward restriction via keyword IIWR.
RC:DAMBI	Builds DAG translator auxiliary blocks with associated mask block indexes which link the mask block auxiliary block to the DAG translator. Keywords used to assign mask blocks to line configuration packages are LCP, SPLT, and MBI.
RC:DAMSK	Builds mask block translator auxiliary blocks (one per mask block index) and associates MLG terminals with inward and/or outward restrictions via

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TABLE C

PROCESSOR TIME FOR CCSR CONTROL FUNCTIONS

FUNCTION	NUMBER OF CYCLES	
	NO. 1 ESS	NO. 1A ESS
Move line to specified FG	4250	8500
Display lines in specified FG	2050+600/line found	4100+1200/line found
Display line's FG number	4350	8700
Initialize all lines	2350+150/(No. of FGs)+3/8 (No. of lines)(No. of FGs)	4700+300(No. of FGs)+3/8 (No. of lines)(No. of FGs)
Move group of lines to specified FG	3650+11/16 (No. of lines moved)	7300+11/16 (No. of lines moved)
Clear displayed lines' message units and move line to a preprogrammed FG	4450	8900
Activate or deactivate intra-centrex inward restriction	1850	3700

keywords IWR, OWR, and TERS.

RC:DATER Adds header information (words 0 and 1) to the mask block translator auxiliary blocks via keywords IWR and OWR.

RC:MLHG Builds nonhunt MLG common block; assigns inward and outward call restrictions via keywords IWR, IWR, and OWR.

13. TESTING

13.01 The CCSR features can be tested by performing the following steps: [Refer to references B(1) through B(4) in Part 18 for detailed information concerning input and output message formats.]

- (a) The TTY input message used to verify the assignment of the multiline group common block and the centrex common block is

VFY-CSTG-aa bbbb,
where aa is the type of list for which information is desired and bbbb is the number of the group (i.e., the multiline group number or centrex number).

System response is OK followed by TR15 or TR17.

- (b) The TTY input message used to verify the assignment of the directory number translations for the customer group is

VFY-DN-aa bbb bbbb,
where aa is the type of request for which information is desired and bbb bbbb is the directory number.

System response is OK followed by TR01 or TR08 with the translation data.

- (c) The TTY input message used to verify the data display route index is

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VFY-EXP-aa bbbb,

where aa is the type of request for which information is desired and bbbb is the number used to specify the route index for which the translation verification is requested.

System response is OK followed by TR05 with the translation data.

- (d) The TTY input message used to verify one or more line equipment number translations is

VFY-LEN-aa bb c d e f gg,

where aa is the type of request for which information is desired, bb is the line link network, c is the line switch frame, d is the bay, e is the concentrator, f is the switch, and gg is the level.

System response is OK followed by TR03 with the LEN translation data.

- (e) The TTY input message used to verify that the centrex digit interpreter tables are properly assigned is

VFY-XDGNT-aabccccdeeee,

where aa is a constant in the variable field, b indicates whether or not recent change information is requested, c is the number of the following leftmost digits to be interpreted, dddd are the digits to be interpreted, and eeee is the centrex number.

System response is OK followed by TR18 with the information from the centrex digit interpreter.

- (f) Enter test codes (*6t) from inquiry and display station. Test display circuit for all digits.

- (g) Perform test calls to verify that the appropriate originating and/or terminating restrictions are effective when calls to or from the extension lines are attempted.

14. OTHER PLANNING TOPICS

14.01 Special attention should be given to insure that adequate call store area is available for the restriction mask blocks. Refer to Part 11 for detailed usage.

ADMINISTRATION

15. MEASUREMENTS

15.01 No new traffic or plant measurements are required. Peg and usage counts are available for the response trunk group.

16. CHARGING

AUTOMATIC MESSAGE ACCOUNTING

16.01 Not applicable.

UNIFORM SERVICE ORDER CODES

16.02 The uniform service order codes (USOC) for the CCSR feature are listed below:

- (a) EHP Announcements - Common Equipment
- (b) EHQ Announcements - Per Trunk
- (c) EHK Common Equipment
- (d) EHM Line Configuration Packages - Per Station
- (e) EHL Line Configuration Packages - Per System.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

Data Group—An arbitrary assignment for a CCSR customer's multiline group.

Functional Group—A grouping of CCSR customer extensions which have the same call restrictions.

LCP—Line configuration package. LCPs (0-7) are predetermined line configurations that can be activated via the 90A CPS to control a line's or a group of lines' originating or terminating call restrictions.

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18. REFERENCES

18.01 The following documentation contains information pertaining to or affected by the CCSR feature.

A. Bell System Practices

- (1) Section 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEN (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (2) Section 231-118-324—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (3) Section 231-118-330—RC Procedures for DALNK, DAMBI, DAMSK, and DATER (CTX-8, Issue 2 Through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (4) Section 231-118-331—Centrex-CO/ESSX-1 Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (5) Section 231-118-335—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV (CTX-7, CTX-8, 1E4, and 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (6) Section 231-318-302—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, CFV, and OBS (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System
- (7) Section 231-318-303—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM, CCIS, and TKCONV (Through 1AE5 Generic Program)—2-Wire and HILO No. 1A Electronic Switching System
- (8) Section 231-318-304—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System
- (9) Section 231-318-308—RC Procedures for DALNK, DAMBI, DAMSK, DATER, ESCO, ESN, and TNESN (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System
- (10) Section 231-318-309—Centrex-CO/ESSX-1 Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System
- (11) Section 231-061-050—Service Features—2-Wire No. 1 Electronic Switching System
- (12) Section 231-061-210—Service Circuits—2-Wire No. 1 Electronic Switching System
- (13) Section 231-061-220—Trunks and Miscellaneous Circuits—2-Wire No. 1 Electronic Switching System
- (14) Section 231-061-450—Program Store—2-Wire No. 1 Electronic Switching System
- (15) Section 231-061-460—Call Store—2-Wire No. 1 Electronic Switching System
- (16) Section 231-061-510—Centrex—2-Wire No. 1 Electronic Switching System
- (17) Section 231-062-210—Service Circuits—2-Wire No. 1A Electronic Switching System
- (18) Section 231-062-220—Trunks and Miscellaneous Circuits—2-Wire No. 1A Electronic Switching System
- (19) Section 231-062-460—Processor Community Engineering—Program Stores—2-Wire No. 1A Electronic Switching System
- (20) Section 231-062-470—Processor Community Engineering—Unduplicated Call Stores—2-Wire No. 1A Electronic Switching System

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(21) Section 231-062-475—Processor Community Engineering—File Stores—2-Wire No. 1A Electronic Switching System.

B. TTY Input and Output Manuals

(1) Input Message Manual IM-1A001, No. 1 Electronic Switching System

(2) Input Message Manual IM-6A001, No. 1A Electronic Switching System

(3) Output Message Manual OM-1A001, No. 1 Electronic Switching System

(4) Output Message Manual OM-6A001, No. 1A Electronic Switching System.

C. Other Documentation

(1) Translation Guide TG-1A, 2-Wire No. 1 and No 1A Electronic Switching System

(2) Translation Output Configuration PA-591003, No. 1 Electronic Switching System

(3) Translation Output Configuration PA-6A002, No. 1A Electronic Switching System

(4) Parameter Guide PG-1, No. 1 Electronic Switching System

(5) Parameter Guide PG-1A, No. 1A Electronic Switching System

(6) Office Parameter Specification PA-591001, 2-Wire No. 1 Electronic Switching System

(7) Office Parameter Specification PA-6A001, 2-Wire No. 1A Electronic Switching System.

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c. Commitment date is less than Dispatch Date: If the dispatch date is 04/23/88 and the commitment date is 04/22/88, the formula is expressed as $-(+1 \times 24) = -24$.

The component value that is ultimately derived is multiplied by the normalization constant of .125. The product is subsequently multiplied by the weight in the GDADW table for the TIME TO COMMIT.

As an example, one can consider a Dynamic dispatch where two jobs are equal in all respects except for the time to commitment.

For purposes of illustration, assume that the dispatch date and the commitment date are equal, and the D_#CR value is 0.

	JOB 1	JOB 2	
Maximum	-8	-8	
Commitment	+12.00	+15.00	
Tech Price	-2.00	-2.00	(Assume LOAD FACTR = 100%)
Available Time of Tech	-08.00	-08.00	
Travel Time	-.50	-.50	
Days Difference	-(0 x 24)	-(0 x 24)	

The result of the above calculations is as follows:

JOB 1	JOB 2
$-(-6.5) = +6.5$	$-(-3.5) = +3.5$

The result (e.g., 6.5 and 3.5), whether positive or negative, it is multiplied by the norm constant and the weight in the GDADW table to determine the suitability component for time to commitment.

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For DYNAMIC LOADING, the algorithm steadily increases the amount of component suitability beginning three days before the COMMITMENT date and time, and stops increasing the value three days after the COMMITMENT date and time. The component value for time to commitment does not drop to zero for the technician being dispatched. However, if the D_#CR field has a value of greater than 1, the value for time to commitment will drop to zero for the competing craft. By dropping to zero for competing craft, this prevents jobs whose commitments are in jeopardy of being missed from being "held" for other qualified technicians.

For BULK loading of technicians with LOAD TYPE of B, time to commitment is handled differently. The algorithm determines whether the technician is capable of traveling to the job and completing the work. If the technician is unable to complete the work before the commitment time, the value for time to commitment is reduced to zero. To determine whether to drop the value of time to commitment to zero, the following formula is used:

$$\text{Load Time} + \text{Travel Time} + \text{Tech Price} - \text{ACC} +/- = "X"$$

If "X" is greater than the commitment time, the value is dropped to zero. If it is less than the commitment time, begin the formula for time to commitment. The use of ACC +/- is only used to determine whether to drop the value for time to commitment to zero. If, by the use of this calculation, it is determined not to drop time to commitment to zero, continue with the normal calculation for time to commitment.

For BULK loading of technicians with LOAD TYPE of F, a third scenario is used. The algorithm will load the earliest shift of technicians on GDPAD (e.g., 0700a) before loading next shift of technicians (e.g., 0800a). For LOAD TYPE F technicians being loaded via the GDLOAD screen, the time to commitment continually increases from three days prior to three days after the commitment.

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	6.5	.125	90	64.1
2	3.5	.125	90	39.3

Since Job 1 adds the most weight, it is a more suitable choice.

C. Job Priority

Each candidate job is given a "job priority" represented by a numeric value between 0 and 9 (0 being lowest priority, 9 being highest priority). For maintenance jobs, the priority is set automatically at the time of initial job entry based on the presence of priority "flags" (i.e., AMR, CH, I, FE, etc) on the trouble ticket and the corresponding value set in the GDS JOBPRI table. For LMOS maintenance jobs, an additional prioritizing factor is used. The PRNK value from LMOS is rescaled to a value range usable in GDS through the TTS-GDS LMOS PRNK table. The job priority value derived from the GDS LMOS PRNK table is then added to the job priority value derived from PFS evaluation in the TTS-GDS JOBPRI table. This process results in a total priority not to exceed the highest possible value of 9. Note that job priority will not be reset on subsequent reports for the same trouble ticket. The user also has the ability to update the priority via the GDMSWR screen. For installation jobs, the priority is set to "0" upon job entry unless the restoration priority flag is set. The GDISWR may be used to manually set the priority for installation jobs.

In considering a job for assignment, the priority component will be set to a value between 0 and 9, corresponding to the job priority. The component value is then multiplied by the normalization

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constant of 1.0. The product is then multiplied by the weight for JOB PRIORITY in the ADW table. As an example, assume we have two jobs equal in all respects excluding job priority. One has a priority of 0 and the second a priority of 9, and the weight for the ADW table is 50. The calculations would be as follows:

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	0	1.0	50	0
2	9	1.0	50	450.0

Therefore, all else equal, Job 2 has a greater suitability relative to Job 1.

D. Missed Commitment

This component represents how important it is to the user that missed jobs be selected for assignment. Determination of a "miss" is done in either of the following ways.

- For bulk loading, the algorithm compares the start date and time of the work request to the earliest GDPAD start time for the selected technicians being loaded via the GDLOAD screen. If the start date is greater than the commitment date and time, the work request is considered a missed commitment.

For dynamic loading, when an installation or maintenance job is being considered for selection, if the current time is after the start time of the job, then it is considered a miss.

Note: The start time does not include travel time for the calculation of the missed commitment. At the time of determining the missed commitment, travel times are not accessible to the algorithm.

- A job can also be considered a miss if the missed appointment flag is set to "Y". This flag is populated differently for installation and maintenance jobs. For maintenance jobs, the flag is set automatically based on the following rules: If a subsequent report with a new commitment date/time is received after the current commitment date/time, the job is considered to be a miss for dispatch and the missed appointment flag is set to "Y". Alternatively, if the subsequent report is received prior to the commitment date/time, the job is not a miss and the flag is left blank regardless of a change received in commitment date/time. For installation jobs, the flag is set by the user when returning the job via the GDCOMP screen.

If a miss is detected by either of the above rules, the value of the missed appointment component is set to 1. The component value is multiplied by the normalization constant of 1.0 and then multiplied by the weight for MISSED COMMITMENT from the ADW table.

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As an example, if two jobs are being considered for assignment and they are equal in all respects but one is determined to be a miss and the other is not, then the calculations are as follows. Assuming an ADW weight of 80,

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	0	1.0	80	0
2	1.0	1.0	80	80

Job 2 would be selected prior to Job 1, since its contribution to the job suitability is larger.

E. Bulk Load Evenly

This factor represents how important it is to the user that work be distributed in equal amounts among the available work force. The net effect aims to prevent one technician from receiving all of the "hot" jobs. This component will always be taken into account when the bulk load is performed. Note, however, that this component will have no effect on dynamic selection if the D_#CR field in the GDS LOAD FARMS table is set to "0" or "1".

The effect of this component is evaluated differently relative to the other components discussed up to now. Previously, we were interested in comparing weights for different jobs for a given technician. Here we are interested in comparing weights of the same job but for more than one equally qualified technician.

The component value is determined by calculating the amount of time left on a technician's schedule, expressed in terms of whole and fractional hours. The component value is then multiplied by the normalization constant of .1094, and the product of the two is then multiplied by the weight for BULK LOAD EVENLY in the ADW table.

As an example, if two technicians determined to be equal in all respects are being compared, and a weight of 80 in the ADW table is established, and additionally technician 1 has 1 hour left on his/her schedule and technician 2 has 6 hours left on the schedule, the calculations would be as follows:

TECH	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	1.0	.1094	80	8.752
2	6.0	.1094	80	52.512

In this case, all else equal, technician 2, who has more time left relative to technician 1, would receive the job.

F. Distance to The Garage

This factor indicates how important it is to the user that the travel time between the technician's location and the garage be minimized as the technician approaches the end of the shift. The net effect is to draw the technician back to the garage as the day comes to a close. Here we are interested in the distance between the candidate job and the garage location. The travel time is determined in the same manner as for the component "distance to technician" using the GDAATR/GDDATR tables. Refer to that previous section for more detail.

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The formula for determining the Component Value for Distance to Garage is illustrated by the following:

$$\frac{\text{End of Shift} - \text{Current Time} = X}{X - \text{Travel Time to Job} = Y} \times \frac{\text{Travel Time from Job to Garage}}{Y} = \text{Component Value}$$

Where

- End of Shift = 0500p or 17
- Current Time = 0100p or 13
- X = 4
- Travel Time to Job = 10 minutes or .166
- Travel Time from Job to Garage = 15 minutes or .25

Inserted in the above formula, the following Component Value will be determined:

$$17 - 13 = 4$$

$$4 - .166 = 3.83$$

$$\frac{.25}{3.83} = .065$$

The Component Value is .065. You can see that as the technician gets closer to the end of his/her shift, the Component Value will increase. This gradual increase will "draw" the technician back to the garage in the afternoon.

The component value is expressed in terms of whole and fractional hours. For example, a component value of 30 minutes is .5 versus a component value of 1 hour which is 1.0. The component value is multiplied by the normalization constant of .25 and then multiplied by the weight for the DIST TO GARAGE in the ADW table. Again, it is logical that the smaller the distance, the more suitable the job. Therefore, this factor is considered to be a negative contributor to job suitability and the resulting value will be treated as a negative number in the calculation.

As an example, if two jobs equal in all respects are being compared and one has a 60 minute component value to the garage and the second has a component value of ten minutes, the calculations would be as follows with an ADW weight of 80.

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	1.0	.25	80	-20.0
2	.166	.25	80	-3.32

In this case again, the smaller the negative number, the greater the suitability. Therefore, Job 2 is considered more suitable relative to Job 1.

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G. Meet Appointments

This component indicates the emphasis that users place on meeting appointments. It is important to realize that the MEET APPOINTMENT component is an "appointment" factor and not a "commitment" factor. This component uses two formulas to calculate the suitability of the work request when there is an appointment time involved as well as manage the dispatch time to insure that the arrival of the technician corresponds with the window established by the algorithm. The first formula determines the "window" or technician availability. If the work request meets the edits of the first formula, i.e., the technician being dispatched is capable of arriving within the "window," the work request is subjected to the second formula, component suitability. This formula determines the additional weight to be added to the work request's overall suitability component. In calculating the formulas, segments of hours will be expressed as fractions. For example, 90 minutes is converted to 1.5 hours. This weight is in addition to any weight already added to the total suitability (distance, missed commitment, etc.).

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The first formula, Technician Availability, is calculated below for both maintenance and installation work.

Technician Availability (Installation)

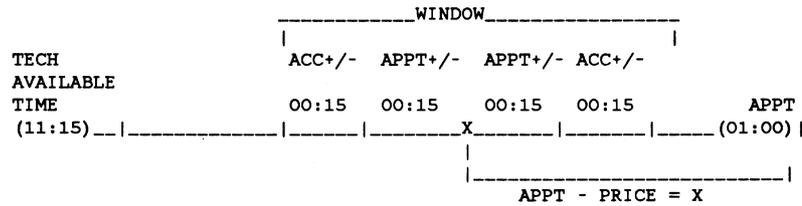
$$(APPT\ TIME) - (WIRING\ PRICE) + (ACC+/-) + (APPT+/-) = WINDOW$$

WHERE:

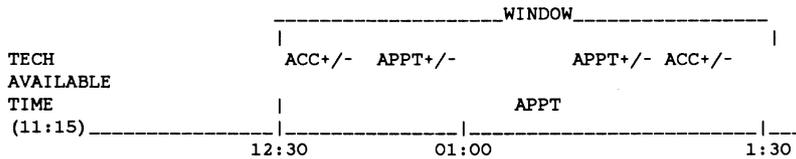
APPT	=	01:00P	OR	13.00
WIRING PRICE	=	00:45		.75
ACC+/-	=	00:15		.25
APPT+/-	=	00:15		.25

E.G. $13.00 - .75 = 12.25$
 $12.25 +/- .5$ (sum of ACC+/- and APPT+/-) = window

In this case, the "window" is from 11.75 to 12.75 OR
 11:45 to 12:45. The calculations are illustrated below:



Technician Availability (Maintenance)



For maintenance work, wiring price is '00:00'. The window is established with the APPT+/- and ACC+/- on either side of the APPT on the maintenance work request. If the technician cannot arrive within the "WINDOW", the job will not be dispatched on the APPT. date.

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If the technician will arrive outside the established window, the work request is not considered to be a candidate for the technician. If the technician can travel to the work location, and arrive within the "window" established by the calculation, the work request is considered to be a candidate for the specific technician being dispatched. The restriction created by the appointment window is valid on or before the appointment date. If the work request is not dispatched by the appointment date, i.e., the dispatch date is greater than the appointment date, the window restriction is removed. It must be recognized that if an APPT is missed, the user must establish a new appointment time for the work request.

Suitability Value

After the work request is determined to be a suitable job for the given technician, the suitability value must be determined. This value is multiplied by the normalization constant. The result of this transaction is then multiplied by the weight in the ADW table for MEET APPOINTMENTS. The following formula is used to arrive at the suitability value:

Normalization Constant - (Available Time - APPT Time - Wiring Price)

WHERE:

- Normalization Constant = maximum number of hours between Available Time and Appt Time (4)
- Available Time = Time when technician is being considered for dispatch (11:15)
- APPT Time = APPT field on GDISWR (01:00)
- Price = Wiring Price of work request (00:45)
- ADW WT = User defined weight on GDADW (99)

When performing the mathematical functions, the algorithm uses the "absolute value" of Available Time, APPT, and Price. The absolute value of this subtraction process is always expressed as a positive value.

To calculate the suitability value of this situation, we could substitute the factors used in the previous formula to illustrate the following:

- STEP 1 4 - (11.25 - 13.00 - 00.75)
- STEP 2 4 - 1 = 3

Now that the suitability value has been determined, we can use the standard formula illustrated throughout this section to arrive at the total suitability factor.

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	3.0	.25	99	75.0

You can see that the closer the Available Time is to the APPT, the higher the "suitability value" is, and therefore more weight will be produced for the job in question. The more weight or component suitability a job has, the sooner it will be dispatched.

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H. Out of Service

This component applies only to LMOS maintenance jobs and represents how important it is to the user that out of service jobs be selected for dispatch prior to affecting service jobs. The job will be flagged as out of service/affecting service at the time of job entry based on the first character entry in the SCRNRSLT field. If it is a "1", then an out of service flag is set to "Y". If it is a "0", the flag is set to "N". The default value is "N".

If the job is out of service, the value of the out of service component is set to "1". Otherwise, it is set to "0". The component is then multiplied by the normalization constant of 1 and the product is subsequently multiplied by the weight for OUT-OF-SERVICE in the ADW table.

As an example, if there are two jobs being compared for assignment and they are equal in all respects except that one is out of service and the other is not, the calculations would be as follows (assume an ADW weight of 60):

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	0	1.0	60	0
2	1.0	1.0	60	60

Job 2 (out of service) has a greater suitability relative to Job 1.

I. Subsequent Reports

This component is applicable to LMOS maintenance jobs only and affects how the presence of subsequent reports influences a job's selection. Each time GDS receives a trouble ticket from LMOS for the same active work request in GDS, the "Pending" field on the BOR is checked. GDS increments the subsequent counter by the actual number of subsequents received in LMOS.

The component value ranges between 0 and 99 and is equal to the number of subsequent reports. The component value is then multiplied by the normalization constant of .25 and the resulting product is then multiplied by the weight for SUBSEQUENT REPORT in the ADW table.

As an example, assume there are two jobs of interest and they are equal except for their subsequent counters. Job 1 has a count of 8 while Job 2 has a count of 1. With an ADW weight of 70, the following numbers are derived:

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	8.0	.25	70	140.0
2	1.0	.25	70	17.5

Job 1 has a higher suitability, in this case, relative to Job 2.

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J. Repeat Reports

This component represents how important it is to the user that repeat reports be selected for assignment. A repeat report applies only to LMOS maintenance work and is defined to be a trouble report that had a previous report cleared within 30 days. It is determined at job entry time by comparing the current date to the last cleared date.

For Special Service trouble tickets from SSC, the Repeat flag is set if GDS completes the trouble ticket to SSC and SSC resends the same trouble ticket to GDS after determining that a second dispatch is necessary.

The component is given a value of 1 if it is a repeater. Otherwise, it is 0. The component value is then multiplied by the normalization constant of 1.0. The resulting product is then multiplied by the weight for REPEAT REPORT in the ADW table.

As an example, if two jobs of equal qualifications for selection are compared, and one is a repeater and the other is not, then, with a weight of 90, we would derive the following numbers:

JOB	VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
1	0	1.0	90	0
2	1.0	1.0	90	90

The second job has a greater suitability relative to the first.

K. Job Type

This factor represents how important the user considers jobs of various types to be for job selection. The value of this component carries a constant of "1". It is multiplied by the normalization constant of 1.0 and the resulting product multiplied by the weight in the JTW table.

As yet another example, two jobs of different job types would contribute the following to their respective suitability. With a weight of 40 for Job 1 and 80 for Job 2, then

JOB	VALUE	NORM CONSTANT	JT WEIGHT	COMPONENT SUITABILITY
1	1.0	1.0	40	40
2	1.0	1.0	80	80

Again, Job 2 has the greater suitability.

Following analysis, the numeric values of each component are summed. A constant of '1000' is added to the total. The end result is the job suitability.

For each technician being considered for work, the suitability for each candidate job is calculated. The job with the greatest suitability for the technician of interest is then assigned.

The reader is referred to Tables 3-20 and 3-21 for examples of job suitability calculations.

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L. Summary

The GDS job assignment process is a very powerful tool. Through the use of table options, the user can control, to a great extent, how the process works for a given work center. The remainder of this section is dedicated to loading procedures and work document distribution. During the loading process, both bulk and dynamic, the previously defined algorithms are used.

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Table 3-19. Job Suitability Worksheet

COMPONENT	COMPONENT VALUE	NORM CONSTANT	ADW WEIGHT	COMPONENT SUITABILITY
DIST TO TECH (HRS)		.25		
TIME TO COMMIT (HRS)		.125		
JOB PRI (0-9)		1.0		
MISSED COMMT (0-1)		1.0		
LOAD EVENLY (HRS)		.1094		
DIST TO GAR (HRS)		.25		
MEET APPOINTMENTS (HRS)		.25		
OUT OF SERV (0-1) (LMOS)		1.0		
SUBQ RPTS (0-99) (LMOS)		.25		
REPEAT RPTS (0-1) (LMOS)		1.0		
JOB TYPE (1)		1.0		

+CONSTANT

+1000

JOB SUITABILITY

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Table 3-20. Sample Job Suitability Calculation
TWO JOBS EQUAL EXCEPT FOR TIME TO COMMIT

COMPONENT	JOB 1	JOB 2	NORM CONSTANT	ADW WEIGHT	JOB 1 SUITABILITY	JOB 2 SUITABILITY
DIST TO TECH (HRS)	.3	.3	.25	00	0	0
TIME TO COMMIT (HRS)	1.5	3.0	.125	90	16.875	33.75
JOB PRI (0-9)	0	0	1.0	30	0	0
LOAD EVENLY	NA*	NA*	.1094	99	0	0
MISSED COMMT (0-1)	0	0	1.0	70	0	0
DIST TO GAR (HRS)	.50	.50	.25	00	0	0
MEET APPOINTMENTS	3	3	.25	99	75	75
OUT OF SERV (0-1) (LMOS)	1.0	1.0	1.0	05	5.0	5.0
SUBQ RPTS (0-99) (LMOS)	0	0	.25	15	0	0
REPEAT RPTS (0-1) (LMOS)	0	0	1.0	03	0	0
JOB TYPE (1.0)	1.0	1.0	1.0	20	20	20

+ CONSTANT		+1000	+1000
JOB SUITABILITY		1116.875	1133.75

* Assumes that on a dynamic job selection D_#CR in GDS LOAD PARMS table is set to "0" or "1".

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Table 3-21. Sample Job Suitability Calculation

TWO JOBS EQUAL EXCEPT FOR MISSED COMMITMENT

COMPONENT	JOB 1	JOB 2	NORM CONSTANT	ADW WEIGHT	JOB 1 SUITABILITY	JOB 2 SUITABILITY
DIST TO TECH (HRS)	.3	.3	.25	00	0	0
TIME TO COMMIT (HRS)	1.0	1.0	.125	90	11.25	11.25
JOB PRI (0-9)	0	0	1.0	30	0	0
MISSED COMMT (0-1)	1.0	0	1.0	70	70	0
LOAD EVENLY (HRS)	NA*	NA*	.1094	99	0	0
DIST TO GAR (HRS)	.50	.50	.25	00	0	0
MEET APPOINTMENTS	3	3	.25	99	75	75
OUT OF SERV (0-1) (LMOS)	1.0	1.0	1.0	05	5.0	5.0
SUBQ RPTS (0-99) (LMOS)	0	0	.25	15	0	0
REPEAT RPTS (0-1) (LMOS)	0	0	1.0	03	0	0
JOB TYPE (1)	1.0	1.0	1.0	20	20	20

+ CONSTANT		+1000	+1000
JOB SUITABILITY		1181.25	1111.25

* Assumes that on a dynamic job selection D_#CR in GDS LOAD PARMS table is set to "0".

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3.5.5 Loading Procedures

There are two methods of loading technicians in GDS - dynamic and bulk. Dynamic loading consists of loading technicians with one job at a time. This usually occurs during the day after the first jobs are completed in the maintenance environment and after the bulk loads are completed in installation. Bulk loading is the process of loading technicians with a "first job" or an entire load for the next day. This section will describe the processes involved to accomplish loading technicians with work using both methods.

3.5.5.1 Bulk Loading

A. Bulk Loading Procedures

To initiate the bulk load process, the user will request the GDLOAD screen. The bulk load is generated via two commands - TRIAL and PERM. The trial segment of the load process allows the user to view the loads that are generated and make any necessary changes before making the loads permanent if "DEBUG" field in the GDS LOAD PARMS table is set to "Y". When the TRIAL command is executed, a screen providing the user with information concerning the technicians that had productive time in the GDPAD table, the number of hours of work they were loaded with, and the total travel time for loaded technicians will return. After viewing this screen, press the ENTER key. The GDLOAD screen will return with a message, giving "total" information concerning the trial load. At this point, the JOBIDS that were rejected may be viewed by requesting the GDLST screen. The view of the "BYPASSED"/"LEFTOVER" work requests may only be seen from the terminal that created the trial load. From the loading terminal, the user may "JUMP/FIND" to the GDLST screen to view the "BYPASSED" JOBIDS, or from a clear screen, request the GDLST format and execute the "previous" transaction via the PF7 key. If the first trial load is not acceptable, additional TRIAL loads may be created. The new TRIAL load will overwrite the original trial load. When the new trial load is considered acceptable, the command "PERM" may be executed on the GDLOAD screen (Figure 3-12). The command "PERM" changes the JOBSTAT from "TRL" to "PRE" on the TLOGS of technicians that were loaded. Non-productive time is indicated by a "JOBSTAT" of "****" following the PERM command. If, after the bulk load is permanent, the user is not satisfied with the load, it can be cancelled by the "CANCEL" command. This command cancels the load and returns all preassigned jobs made "pre" through a trial load to the "PLD" JOBSTAT.

NOTE - CANCEL will cancel all trials for the specified center.

By selecting or rejecting supervisor groups and individual technicians, the user can specify who is to be loaded. Jobs can be selected or rejected by DAA and jobtype. These select/reject options are used together. For example, a load that consists of specific jobtypes can be built for all of SUPV GRP A except TECH EC OD1 (who is in SUPV GRP A). Note that if the user does not specifically select or reject a factor, all of that factor is selected. If the reject option is used for a factor, then all but those specifically rejected are selected. If the select option is used for a factor, then ONLY those specifically selected are considered. So if SUPV GRP A is selected, a TECH EC from SUPV GRP B cannot be rejected.

B. Tables

When executing the bulk load process on the GDLOAD screen, the load algorithm visits several tables in order to create a bulk load desired by the user. The following lists the functions provided by the user defined tables:

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• GDPAD

The GDPAD table is used to input the technician's available hours. These hours are subdivided into productive and non-productive times. The technician must have productive time (time type "B") to be considered available for bulk loading.

• GDS Time Types

The purpose of this table is to allow the user to define which time types will be used by the system, and whether they will be productive or non-productive. Any time type may be used in the GDPAD table if it is a valid time type in the GDS TIME TYPES table. There are three valid entries in the PROD/NON field of the GDS TIME TYPES table. They are as follows:

B - An entry of "B" will allow the time type associated with it to be selected for either bulk or dynamic load. For instance, if a technician has a time type that is to 12:00, he is capable of being bulk loaded or dynamically loaded during this time.

D - An entry of "D" will allow the time type associated with it to be selected for dynamic loading only. For instance, if a technician has a time type that is associated with a "D" on his GDPAD schedule for 08:00a to 12:00, he is capable of dynamic loading only (one job at a time).

N - An entry of "N" will not allow the time type associated with it to be selected for bulk or dynamic dispatch. These time types are usually expressed as "LUN", "VAC", "OFF".

• GDTECH

The GDTECH table is used in the bulk loading process to determine the DAAs, JOBTYPES, SUPV groups, and LOAD TYPES for technicians with productive time in the GDPAD table. When the users create a "bulk" load via the GDLOAD screen, the GDTECH table is accessed by the algorithm to insure the technician is loaded in the proper DAA, in the proper SUPV group, and with the correct JOBTYPES. Another important function the GDTECH table performs is determining LOADTYPE. The LOADTYPE determines whether the technician will be loaded via the GDLOAD process with one job, an entire day's work, or not loaded at all. The entries for LOADTYPE are "F", B, and D. They are defined as follows:

F - A technician can be loaded via GDLOAD for one job only if the technician has a LOADTYPE of "F" in the GDTECH table and bulk time available on GDPAD.

B - A technician can be loaded for an entire day's work providing the technician has a LOADTYPE of "B" and bulk time available on GDPAD. If the technician's last entry on GDTLOG is "PRE," their remaining productive hours will also be bulk-loaded.

D - A technician with LOADTYPE of "D" is never considered for the bulk load via GDLOAD process. If the LOADTYPE of "D" is used, the technician can be loaded through the dynamic (one job at a time) process only.

• GDS LOAD PARMS

— The B_WR*AVL field specifies the total amount of candidate jobs to be considered when bulk loading, with a system maximum of 3000 candidate jobs per load. The number in this field is multiplied by the total number of available technician hours to get the total number of jobs. For example, if 10 technicians are being bulk loaded and each works an 8 hour shift, and the value in B_WR*AVL is 10 then $10 * 8 * 10$ or a maximum of 800 jobs will be considered when bulk loading. The default is "10". The user must always set the value of B_WR*AVL to "99".

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- The B_#WRMAX field specifies number of candidate jobs (1-999) to be considered simultaneously during the bulk load when assigning work to one technician. The default is "0". The user must always set the value of B_#WRMAX to '999'. After every job assignment, the job pool specified here is replenished with a new job. The value for the new job and the technician assigned work are recalculated.
- The #DAYSFWD field (0-9) specifies the number of days to look forward when selecting jobs for evaluation by either the bulk or dynamic load. A "2" entry extends the candidate job pool to jobs due two days beyond the load date. The default is "0".
- The APPT+/- field is used to expand the "start time" of work requests when there is an APPT on the work request. The algorithm uses this formula:

$$\text{APPT time} - \text{wiring price} + (\text{APPT}+/-) = \text{window}$$

This window is the time period in which the technician must be capable of arriving at the work location. Remember, there is no wiring price on maintenance work (wiring price = 00.00).

- The ACC+/- field is used on four occasions. The first occasion, when there is an APPT time on the work request, the ACC+/- time is added to the APPT+/- time to further expand the "window". In the example above, if the ACC+/- field is populated on the GDS LOAD PARMS table, the formula would be calculated as follows:

$$\text{APPT time} - \text{wiring price} + (\text{APPT}+/-) + (\text{ACC}+/-) = \text{window.}$$

The second occasion is on work requests where there is not an APPT and the "A" and "B" fields are populated. In this instance, the time in the ACC+/- field is simply subtracted from the "A" field and added to the "B" field. For instance, if the A field is 01:00p, the B field is 03:00p, and the ACC+/- field is 00:30, the window in which the technician could arrive at the customer's premises is between 12:30p and 03:30p. If there is an APPT time and populated A and B fields, the algorithm overwrites the A and B windows and uses this formula to recalculate the window.

The third occasion is when there is a delayed maintenance or no-access condition on the work request. In this instance, the ACC+/- field is used to reduce the DM/NA window. For instance, if the DM/NA field is from 0100p to 0300p, and the ACC+/- field is populated with 00:30, the work request will not be available for dispatch from 0130p to 0230p.

The fourth occasion is when the time to commitment formula is calculated (for loading for load type B only). If the current time, plus travel to the job, plus price of the job, minus the value of ACC+/- extend past the commitment date and time, the value for time to commitment is dropped to zero.

All jobs that do not meet the above qualifications are not considered for assignment to the given technician. The remaining jobs are then sorted in order of the "start time". The start time is calculated by the system at the time of job assignment to be equal to the current commitment time promised to the customer minus the estimated time needed to complete the work, i.e., the price and the travel time to the candidate job. This applies to both installation and maintenance jobs. The start time represents the latest possible time that the candidate job can be started in order that the work be completed prior to the commitment time promised to the customer.

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3.5.5.2 Dynamic Loading

A. Dynamic Loading Procedures

Dynamic loading is the process of dispatching technicians on one trouble/service order at a time. To initiate the dynamic dispatch, the user will request the GDDISP screen. The command "DIS", CENTER, and TECH EC are required to initiate the dispatch. The user can "manually" dispatch a technician by typing in a JOBID in the "manual JOBID" field. Any technician can be manually dispatched on any JOBID regardless of SUPV GROUP, JOBTYP, or access data. This feature provides flexibility for special situations that may arise during the course of the day.

GDS provides another feature in the dynamic dispatch scenario. When completing a work request on the GDCOMP screen, if the technician still has productive time on the GDPAD, and DISPATCH TYPE N is not used, GDS will automatically dispatch the technician on another work request. The user will see an automatic screen change from GDCOMP to GDDISP with a message "DISPATCH SUCCESSFUL" at the bottom. If the GDJTW table has the PREDISP TEST flag set to "Y", GDS will automatically request a MLT test at the same time. Approximately 30 seconds later, the command "DTR" may be used to view the MLT VER CODE and SUMMARY.

B. Tables

During the dynamic load process, the load algorithm visits many of the same tables used by the bulk load process. The following lists the functions provided by the user-defined tables:

• GDPAD

The GDPAD table separates the work shift into productive and non-productive intervals of time. For a technician to be considered available for the dynamic process, there must be a productive time type in the GDPAD. GDS will dispatch a technician after the GDPAD and time (dynamic only).

• GDS Time Types

There are three valid entries in the PROD/NON field of the GDS TIME TYPES table. They are B, D, and N. For the purposes of dynamic dispatch, entries of B and D can be used. Any interval of time on the GDPAD associated with a non-productive time type (N) eliminates the technician from being dynamically dispatched.

• GDTECH

The GDTECH table is used for dynamic dispatch in basically the same way as for the bulk load process. For dynamic dispatch, the LOADTYPE can be any one of the three options, B, D, or F.

• GDS LOAD PARMS

- The D_#WR field specifies the maximum number of candidate jobs (1-999) to be considered in selecting a job for dynamic assignment. The system assumes a default value of 100 if the field is not populated. The user must always use a value of "999".
- The #DAYSFWD field (0-9) specifies the number of days forward from the date that work is to be assigned, i.e., the load date, that the system should look at when selecting the candidate jobs. A "0" entry restricts the candidate job pool to jobs due on the day work is to be assigned, or earlier than that date. The default is "0".
- The D_#CR field is used to indicate the number of qualified technicians that should be taken into account when selecting a job for a given technician. A technician is equally qualified if he/she has at least one job type and/or one DAA in common with the technician that is receiving

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work.

It is important to understand that the D_#CR field indicates the total number of craft competing for the job in question. For instance, if the D_#CR field is populated with a "1", the load program will ignore other technicians. If the D_#CR field is populated with a "3", the load program is making the load decision of best craft using the technician being dispatched, plus two additional competing technicians, for a total of 3. In some cases, the net effect is to take a job that one would think should be assigned to the technician receiving work and to "save" it for another equally qualified technician. This is desirable in situations where, for example, the equally qualified technician is "next door" to a job and is free to receive a new assignment in 5 minutes versus the technician receiving work who needs to travel 25 minutes to get to the same job.

An entry of "0" or "1" in this field will cause (1) all other technicians to be ignored in dynamic job selection and (2) the BULK LOAD EVENLY component on ADW to be non-effective on dynamic job selection. The default is "10".

- The D_HRSFWD is used in conjunction with the D_#CR field to establish an "availability range" for equally qualified technicians. In other words, if this field is set to "01:00", in order for the equally qualified technician to be considered for assignment to a particular job, he/she must be free to accept work within one hour's time. Otherwise, the equally qualified technician is not considered for assignment to that job. The field must contain a time in the format HH:MM. The default is "01:00".

- The APPT+/- field is used to expand the "start time" of work requests when there is an APPT on the work request. The algorithm uses the following formula:

$$\text{APPT time - wiring price} + (\text{APPT+/-}) = \text{window}$$

This window is the time period in which the technician must be capable of arriving at the work location. It is important to remember that maintenance work has no wiring price.

- The ACC+/- field is used on four occasions. The first occasion when there is an APPT time on the work request, the ACC+/- time is added to the APPT+/- time to further expand the "window". In the example above, if the ACC+/- field is populated on the GDS LOAD PARMS table, the formula would be calculated as follows:

$$\text{APPT time - wiring price} + (\text{APPT+/-}) + (\text{ACC+/-}) = \text{window.}$$

The second occasion is on work requests where there is not an APPT and the "A" and "B" fields are populated. In this instance, the time in the ACC+/- field is simply subtracted from the "A" field and added to the "B" field. For instance, if the A field is 01:00p, the B field is 03:00p, and the ACC+/- field is 00:30, the window in which the technician could arrive at the customer's premises is between 12:30p and 03:30p. If there is an APPT time and populated A and B fields, the algorithm overwrites the A and B windows and uses this formula to recalculate the window.

The third occasion is when there is a delayed maintenance or no-access condition on the work request. In this instance, the ACC+/- field is used to reduce the DM/NA window. For instance, if the DM/NA field is from 0100p to 0300p, and the ACC+/- field is populated with 00:30, the work request will not be available for dispatch from 0130p to 0230p.

The fourth occasion is when the time to commitment formula is calculated (for BULK loading for load type B only). If the current time, plus travel to the job, plus price of the job, minus the value of ACC+/- extend past the commitment date and time, the value for time to commitment

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is dropped to zero.

3.5.6 Work Document Distribution

One of the labor-intensive work operations within maintenance and installation centers is building and distributing the next day's work loads to the outside technicians. The task of building the loads has been simplified by the bulk load procedures described in the previous section. The purpose of this section is to describe the distribution of these loads to the technicians via the GDISSU screen.

A. GDISSU

The normal scenario within a CENTER environment is to create a bulk load (complete bulk loads or individual first jobs). After completing the GDLOAD process, the user will request the GDISSU screen by entering /FOR GDISSU. An example of this screen can be seen below. Valid commands are as follows:

- FIND - Returns only ONE document for a specific job issue
- ISS - Starts the issue process
- CAN - Cancels the issue that is in progress
- REFRESH - Clears screen of existing data
- HELP - Provides the user with on-line information if there was an error message during a process
- OVERRIDE - Issues ALL documents; ignores SUPPRESS feature.

GDISSU is a center based facility which gives the user a significant amount of flexibility in determining the types of documents to be distributed as well as the printer locations.

The first step for the user is to determine which type of documents will be distributed. Documents are selected for distribution by entering an "X" in the selection fields. An example of the GDISSU screen and select document section is illustrated below:

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```

COMMAND: -----          GDS:  ISSUE  (GDISSU)                               /FOR -----
                                                                    12/22/89 15:30:46
CENTER:  -----          SOI PARSE OPTION:  --
SELECT DOCUMENTS:
POTS INST:  IWR:  -   SOI:  -
LMOS MAINT:  MWR:  -
SS INST:    ISWR: -   SOI: -   WORD: -
SSC MAINT:  MSWR: -   WORD: -
TECHNICIAN LOG:
SUMMARY ROUTE SHEET:  -
SPECIFIC ISSUE:  JOBID: -----          PRTR: -----
BULK LOAD ISSUE:  ISSUE DATE:  - - - -   SEND TO GARAGE:  -   PRTR: -----
SELECT/REJECT:  -
SUPV GRP:  - - - - -
SELECT/REJECT:  -
TECH EC:  - - - - -
    
```

Figure 3-11. GDISSU

The user will select the specific documents by placing an "X" in all selection fields desired. An "X" in the WORD document fields produces the parsed WORD, while a "W" in the same field results in the unparsed/whole WORD document. If the SOI PARSE OPTION field is populated, and an SOI field is marked with an "X", the TTS table GDS SOI PARSE is checked to determine which sections of the Service Order Image are to be issued. Otherwise, the whole SOI will be issued when it is one of the selected documents.

The next part of the SELECT DOCUMENTS section allows distribution of the TECHNICIAN LOG and/or the SUMMARY ROUTE SHEET. These two documents can be requested only if the BULK LOAD ISSUE is being used. To select a document, simply type an "X" in the field being requested.

The third section of the GDISSU screen is SPECIFIC ISSUE. This section allows the user to reroute individual JOBIDs to user-specified printers. If the JOBID field is populated, the PRTR field must be populated with any user-specified printer.

The fourth section of the GDISSU screen is the BULK LOAD ISSUE. This section allows the user to distribute the bulk loads or "packages" consisting of documents selected in the first section to garages and/or a unique printer. This distribution can consist of simply the IWR, ISWR, MWR, or MSWR. However, the packages or loads can become quite complex if several document types, TECHNICIAN LOG, and SUMMARY ROUTE SHEET are selected. This section also consists of the SELECT/REJECT options on SUPV GRP and TECH EC. If an "S" is input in the SELECT/REJECT field, and a valid supervisor group number is typed in the SUPV GRP field, only that supervisor will receive loads via the GDISSU. If an "R" is typed in the SELECT/REJECT field and the SUPV GRP field is populated with a valid supervisor group number, all supervisor groups in the center but this one will receive loads via GDISSU. The same logic applies to the TECH EC field. Remember, if you use the

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select option and the reject option on the same GDISSU screen, whatever item you reject must be in the originally selected group. For example, if you select SUPV GRP A, any TECH ECs that are rejected must be in the selected SUPV GRPs.

NOTE - The bulk issue process is used in conjunction with the SUPPRESS field in the GDS ISSUE OPTS TTS table. When SUPPRESS is set to "Y", a document will not be reissued if nothing has changed on the work request since the last time the document was issued. The only changes/updates tracked by the issue process are SOP/SOAC passes, TIRKS messages, GOC messages, and a change in TECH EC. When SUPPRESS is set to "N", a document will be issued whether or not changes were made to the work request.

To issue the loads for a center, the algorithm selects all JOBIDs on the TLOGS with job status of "PRE", "DSP" or "****" for the ISSUE DATE and gathers the selected documents via two programs, VGG025T1 and VGG027T1. The VGG025T1 gathers just the GDS specific documents, i.e., TLOGS, IWR, ISWR, MWR, MSWR, and SOIs. The VGG027T1 is only used when issuing a load that contains the WORD document. The issue program then distributes the documents according to the SEND TO GARAGE or PRTR fields. If the SEND TO GARAGE field is selected with a "Y", the documents will be sent to the printers that correspond to the PRTR field in the GDSUPV table. If the SEND TO GARAGE field is not selected, the PRTR field must be populated. The PRTR field can be any valid printer within the system.

When the "ISS" COMMAND is used, the user will see a message at the bottom of the screen. Examples of these messages are as follows:

```
"SPECIFIC ISSUE SUCCESSFUL AND COMPLETE"
"BULK ISSUE SUCCESSFUL AND IN PROGRESS - 6 SUPV GROUPS 102 TOTAL CRAFT"
```

The phrase "AND IN PROGRESS" is used when the selected documents will contain the WORD document.

NOTE - If any ITEMS associated with an issued JOBID are cancelled or completed, this information will be displayed as the last part of the ITEM information.

B. TSEND Device Type Table - GTSDEV

The GTSDEV table is used to define the printer "type" when distributing documents to Destination Access Codes (DACs) via the GDISSU screen.

To access the GTSDEV table, the entry is /FOR GTSDEV. This entry will produce the following example:

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```
COMMAND:          TSEND DEVICE TYPE TABLE (GTSDEV)          /FOR
                  PRTR:                                       04/20/87 08:48

C DAC    TYPE    C DAC    TYPE    C DAC    TYPE    C DAC    TYPE
-----
```

To add new devices or printer locations, valid entries are as follows:

- C - type "a"
- DAC - type DAC id, e.g., P225
- TYPE - type either "I" (IMS) or "N" (NON-IMS)

When utilizing the GDISSU screen to send documents to a printer, particularly a non-IMS printer, if the printer is not defined in the GTSDEV table, the issue process will not be successful.

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3.6 DISPATCH AND COMPLETION

This section provides the general information on the features associated with the dispatch and completion functions. The on-line screens that support the dispatch and completion process are explained in detail in Section 5.

3.6.1 Dispatch

The dispatch feature allows the GDS user to dispatch a technician through a single automatic function. When a dispatch is performed, the system will either select a job from the Tech's TLOG, dynamically select a job from the pending load pool of jobs, or the user may manually assign a specific job to the technician.

Work may be PREassigned to a technician. Work may be preassigned through the bulk load process, or by manually preassigning a job to a specific technician. Upon dispatch, the system will load the technician with his/her preassigned work.

A technician may be designated the preferred technician for a particular job. This is accomplished by updating the work request with the technician's employee code (EC). At dispatch, the system will attempt to assign the job to the preferred technician if available. If the preferred technician is not available, the job is loaded to another technician.

Technicians may be dispatched to work a job, or dispatched as a helper.

3.6.2 Completion

The completion feature allows the GDS user to complete work automatically through a single function. It allows the technician to complete a job or return a partially complete job, and to apply completion information and comments in a single operation.

When a job is completed by a technician, the system will calculate the time worked on the job, it will invoke an automatic notification of the work completion to the proper operations support systems, and dispatch the next job to the technician.

Simple 2.4 GHz Receive Pre-Amplifier

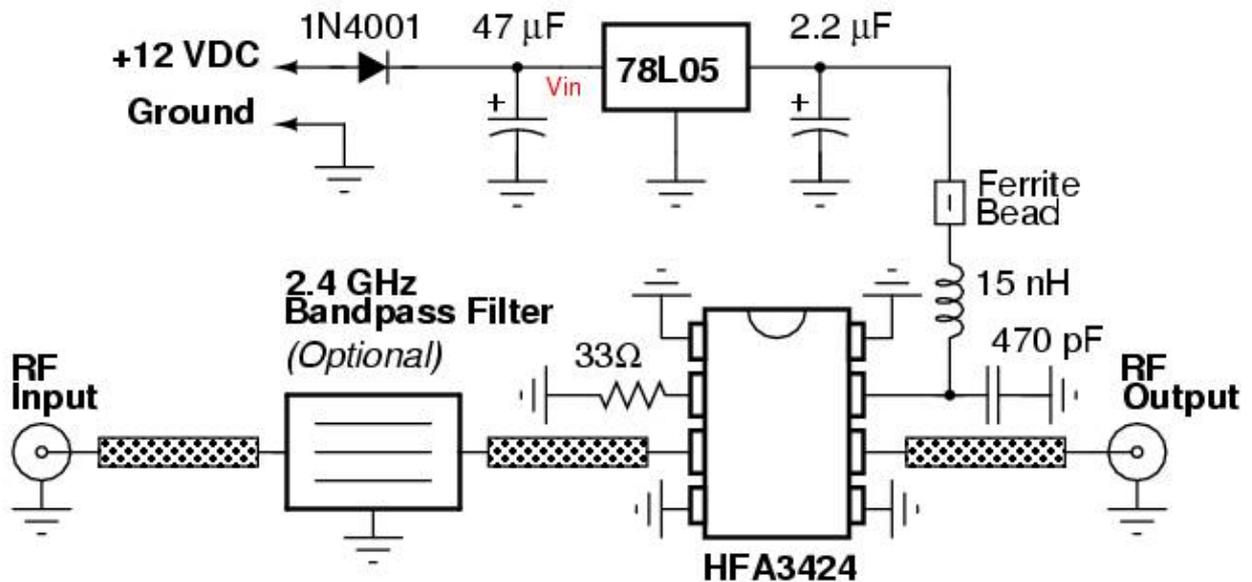
Overview

Old wireless networking cards based on the Harris/Intersil PRISM chipset from the early 1990s are starting to show up from time-to-time at swap fests. These are the older models, while still using Direct Sequence Spread Spectrum (DSSS) in the 2.4 GHz ISM/Part 15 band, only had a maximum data rate of around 2 Mbps. One nice feature of the older PRISM chipset was their use of an external receive pre-amplifier. Most cards used the Harris/Intersil HFA3424 low-noise pre-amplifier chip which gives around 14 dB of gain at 2.4 GHz and, more importantly, doesn't require any complex external impedance matching networks. 50 ohms in, 50 ohms out, just add +5 VDC power and a few bypass caps. This also makes the HFA3424 the perfect choice for extending the range of other devices which need to receive a fairly weak signal in the 2.4 GHz region.

For this project, we'll be using a salvaged HFA3424 to help extend the range of the 2.4 GHz 'warspying' device covered in *GBPPR 'Zine*, Issue #67. One optional addition to the final circuit will be a 2.4 GHz bandpass filter on the HFA3424's RF input. This helps to knock down any out-of-band interference, but will prevent the device from tuning in video signals which are outside of the filter's bandpass frequency range. Mouser and Digi-Key both sell SAW bandpass filters for the 2.4 GHz band, but they're in packages which are horribly small and very difficult to work with. You can sometimes salvage "easier to solder" bandpass filters from older 2.4 GHz wireless network devices. The addition of a 33 ohm bias resistor to pin 2 of the HFA3424 increases the overall RF gain to 16 dB and will also lower the input noise figure, but at the expense of increasing the current draw to around 20 mA. Without the bias resistor, the HFA3424 draws around 5 mA.

Schematic

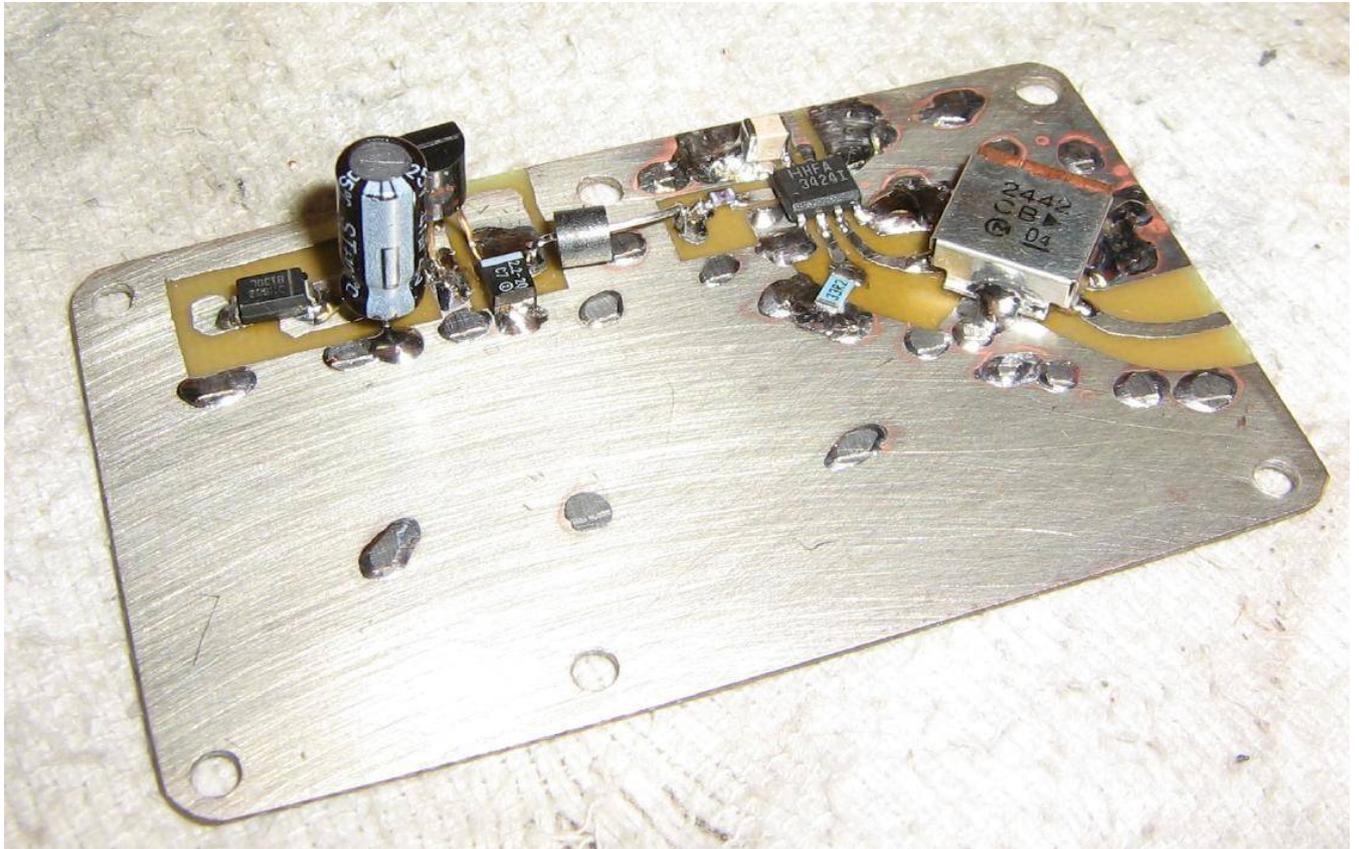
2.4 GHz Receive Pre-Amplifier



 50 Ω microstripline

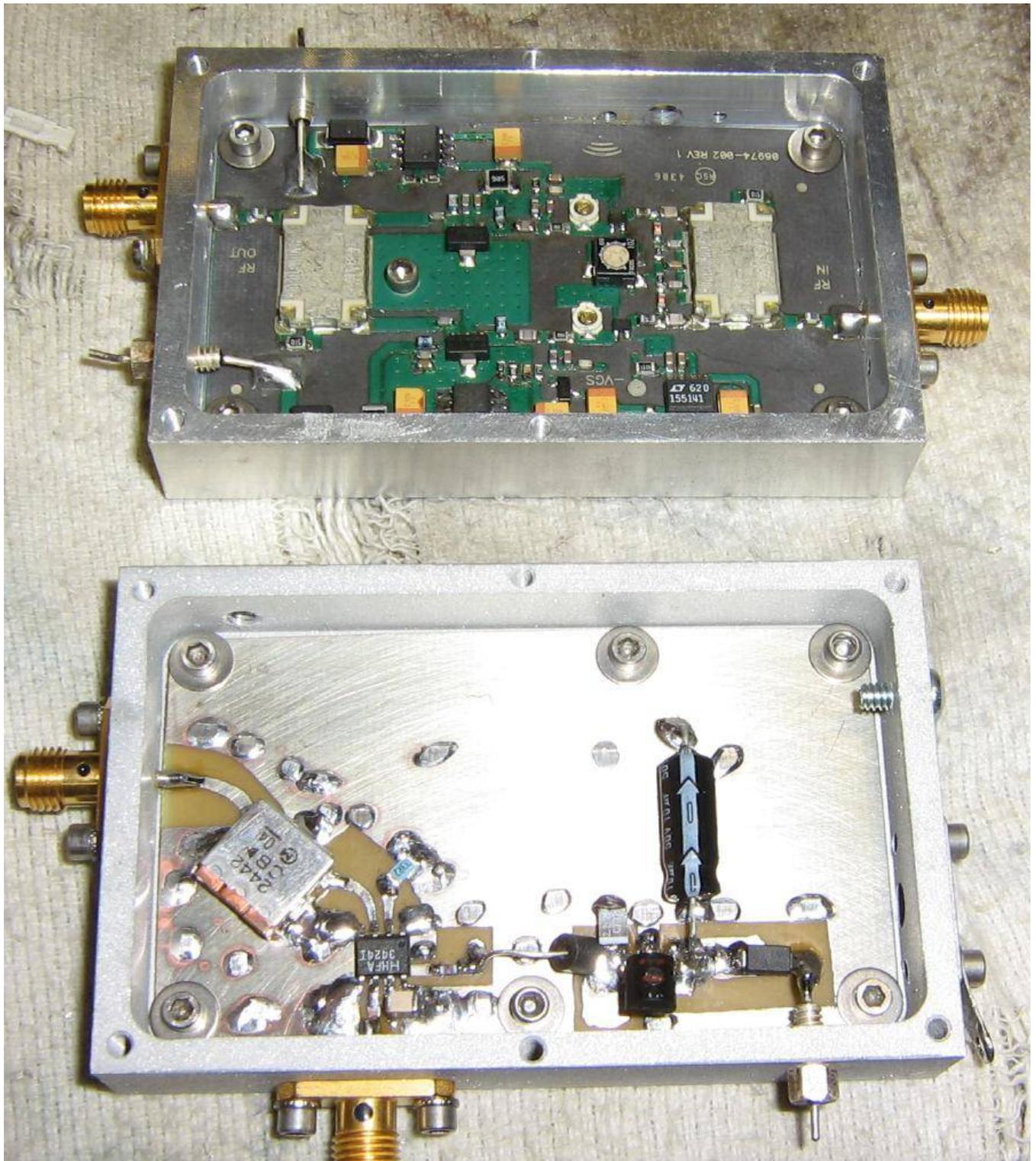
The optional 33 Ω resistor increases the HFA3424 RF gain

Pictures & Construction Notes



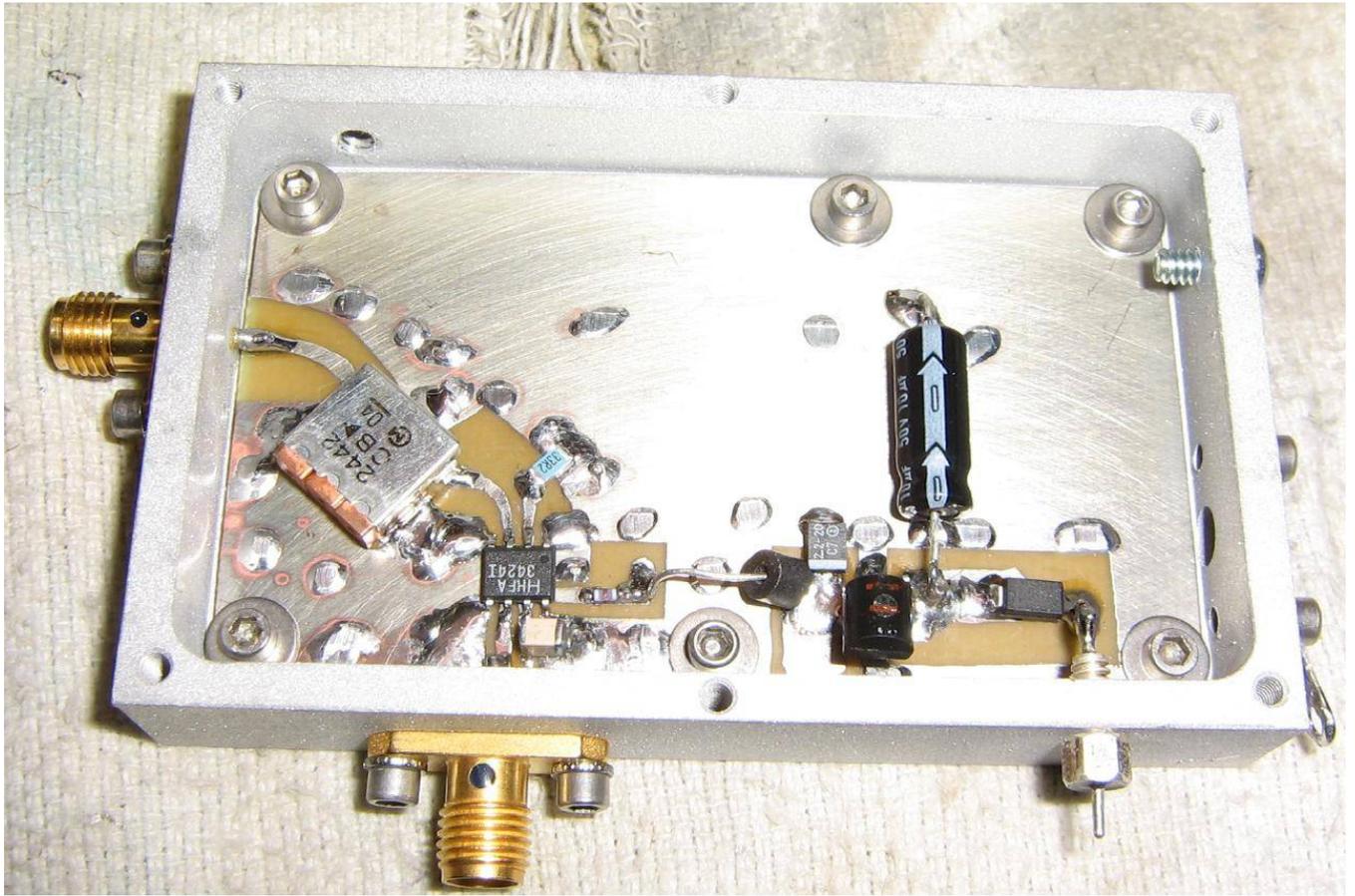
2.4 GHz receive pre-amplifier circuit board.

The 78L05 voltage regulator is on the left. The HFA3424 is on the upper-right. The right-side RF input passes through a 3-pole Murata 2.4 GHz bandpass filter.



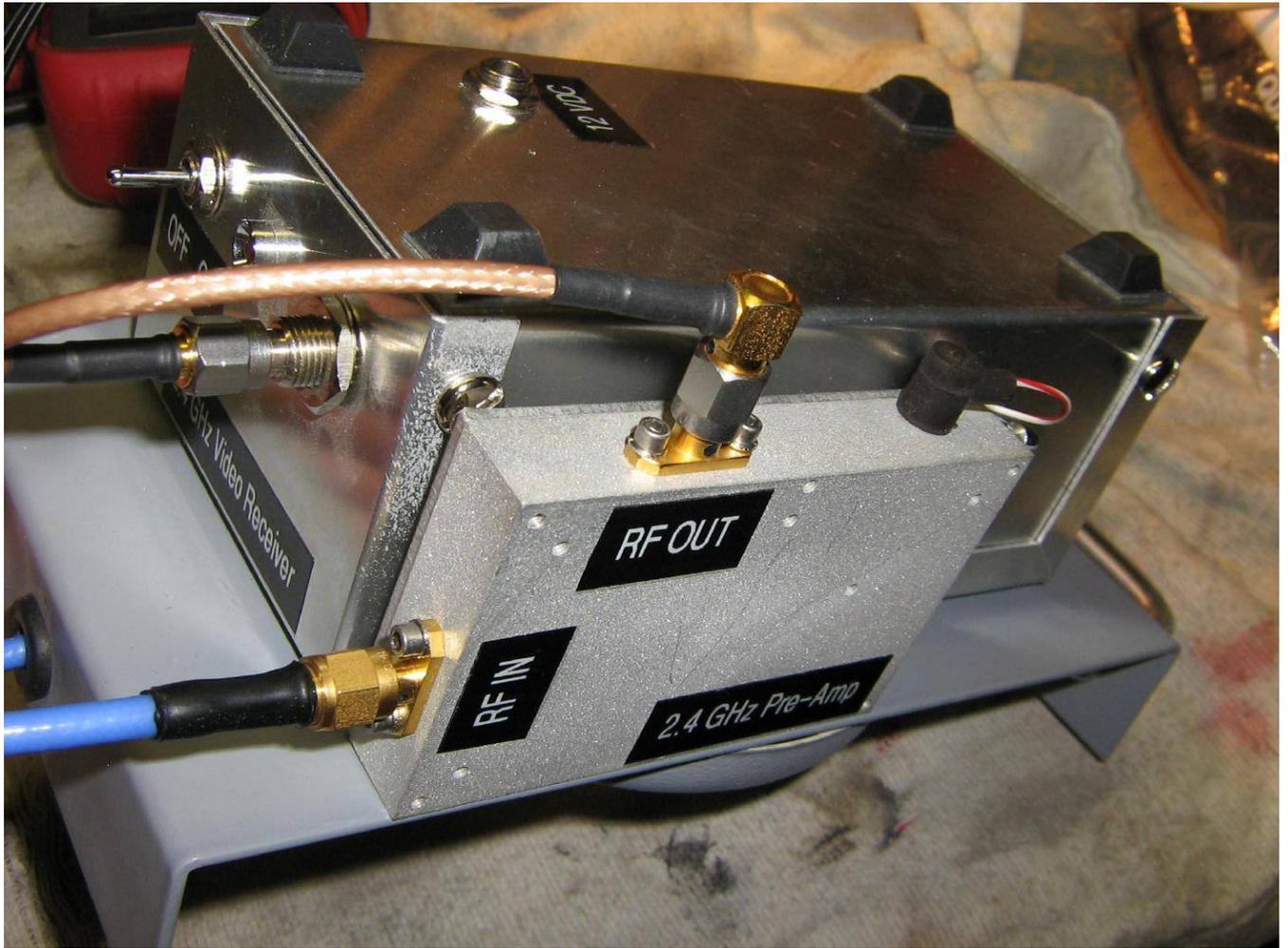
Mounting the new 2.4 GHz receive pre-amplifier circuit board in a cellular pre-amplifier project case I found at a hamfest.

+12 VDC into the voltage regulator is on the lower-right. RF input and output are via panel-mount SMA connectors.



Closeup overview of the completed 2.4 GHz receive pre-amplifier circuit.

The surface-mount 15 nH inductor on the HFA3424's Vdd power line should have a self-resonant frequency above 2.5 GHz.



Installing the 2.4 GHz receive pre-amplifier on the side of the project box holding the original 'warspying' circuits.

The 2.4 GHz antenna connection is on the left-side with the pre-amplifier's output via the top SMA connector.

2 Watt RF Power Amplifier for 10 GHz

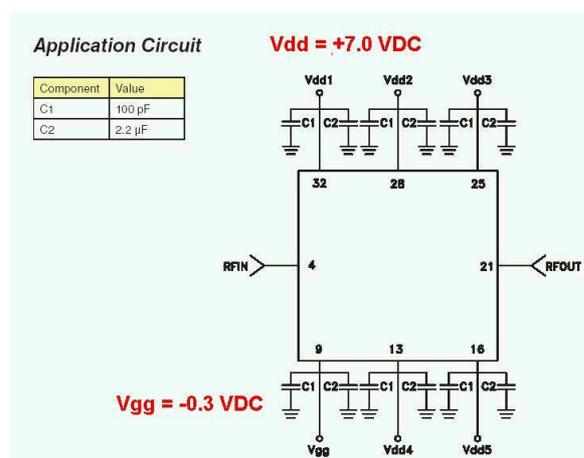
Overview

Generating RF power above a few milliwatts in the 10 GHz band used to be very difficult. Thankfully, Hittite Microwave Corp. has the HMC487, which is an easy-to-use X-band amplifier chip that requires no complicated external RF circuitry or weird voltage biasing. The HMC487 costs around \$60 in single quantities and the evaluation board – which is *highly* recommended – is a couple hundred dollars. The project shown here will be based around the HMC487 evaluation board to help make construction of the final amplifier very easy, even for a beginner microwave experimenter.

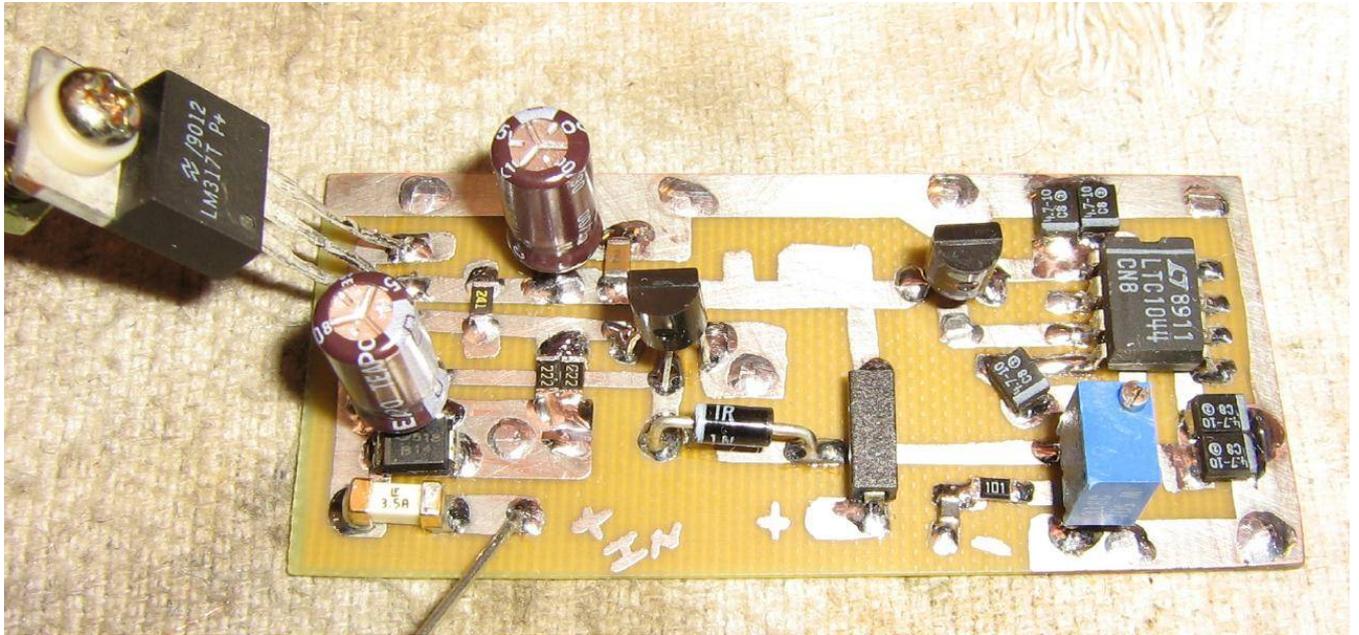
The Hittite HMC487 is a remarkable little chip. It has around 20 dB of gain from 9 to 12 GHz and is internally matched to 50 ohms on both the RF input and output. This means no fussing with complex tuning lines or sliding solder flakes! It will do an easy 1 watt (+30 dBm) RF output with a 10 mW (+10 dBm) RF input over most of the X-band. It saturates at around 2 watts (+33 dBm) and I've heard it can reach 3 watts (+35 dBm) if you run it with a little higher drain voltage and fiddle with the input return loss matching a bit. The only real drawback to the HMC487 is the large amount of heat it needs to dissipate. Its RF efficiency is only around 20% and the rest of this energy will need to be dissipated as heat. To properly do this, a small block of aluminum will need to be milled out in order to securely hold the HMC487 evaluation board. This new aluminum block can act as a heatsink alone, or it can be further attached to a larger heatsink in order to improve cooling. This entire process may be difficult to accomplish if you don't have access to a milling machine, but some type of additional heatsinking, or probably even fan cooling, for the HMC487 evaluation board will be *required*. This is especially true if you plan on operating the amplifier for an extended period of time.

To power the HMC487, a +12 VDC input will be regulated down to +7 volts using a LM317 adjustable voltage regulator. The HMC487 does require a small negative voltage for its gate bias which will be generated with a LTC1044 negative voltage converter and controlled via a 500 ohm multiterm potentiometer. A simple 4.7 volt Zener diode / 2N3904 transistor circuit will "power down" the LM317 voltage regulator until the negative gate voltage is applied to the HMC487. This little Zener voltage pre-conditioning circuit is a requirement to protect the HMC487 when voltage is first applied. When the HMC487's negative gate bias is set (at around -0.3 VDC), the amplifier's supply current (1.3A) will not change whether RF input power is applied or removed.

HMC487 Application Circuit



Pictures & Construction Notes



Overview of the Hittite HMC487 evaluation board power supply circuit.

Nothing too complicated is required, but try to have a good ground plane on the PC board.

The +12 VDC input is from the lower-left and goes through a little surface-mount 3 amp fuse. The LM317's tab will need to be isolated from the project box with a mica washer or thermal pad and a plastic feed-through on the mounting screw. High-quality capacitors can be salvaged from old computer motherboards.

The blackish rectangle thing in the middle is a high-current surface-mount ferrite bead.

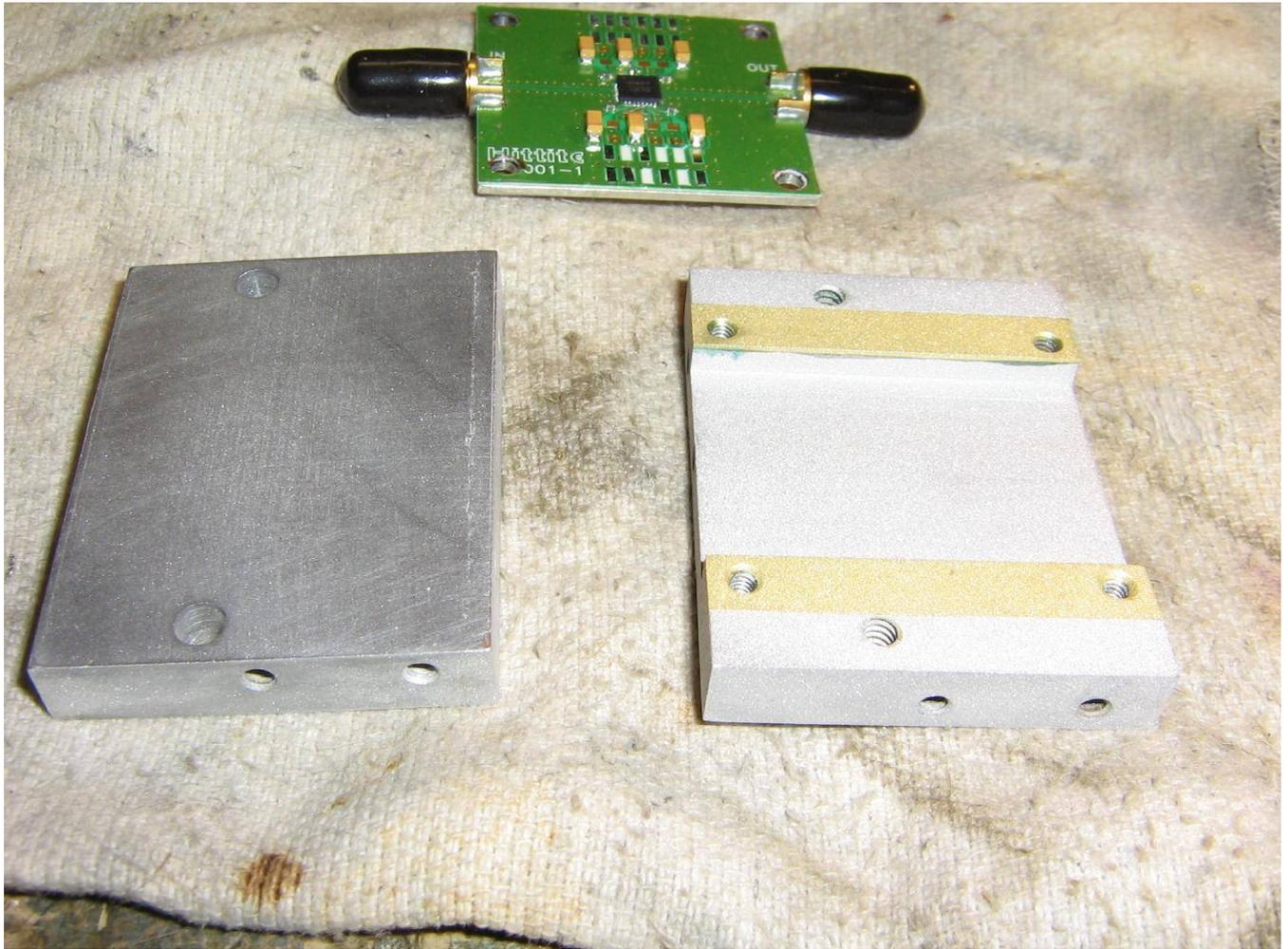
The LTC1044 negative voltage converter is on the upper-right and takes its input from a 78L05 voltage regulator. The -5 VDC output of the LTC1044 is then fed to a multiturn 500 ohm potentiometer. This is used to adjust the HMC487's gate bias for a final quiescent current draw of 1.3 amps. The negative voltage going to the HMC487 should never exceed -2.0 volts.

For additional protection, the +12 VDC power supply feeding this circuit should be current-limited to around 2 amps.



Installing the power supply circuit in the project box.

This old project box was found at a hamfest and already had a bunch of holes drilled in it, so it may look a little funny and is probably a tad too small to house everything.



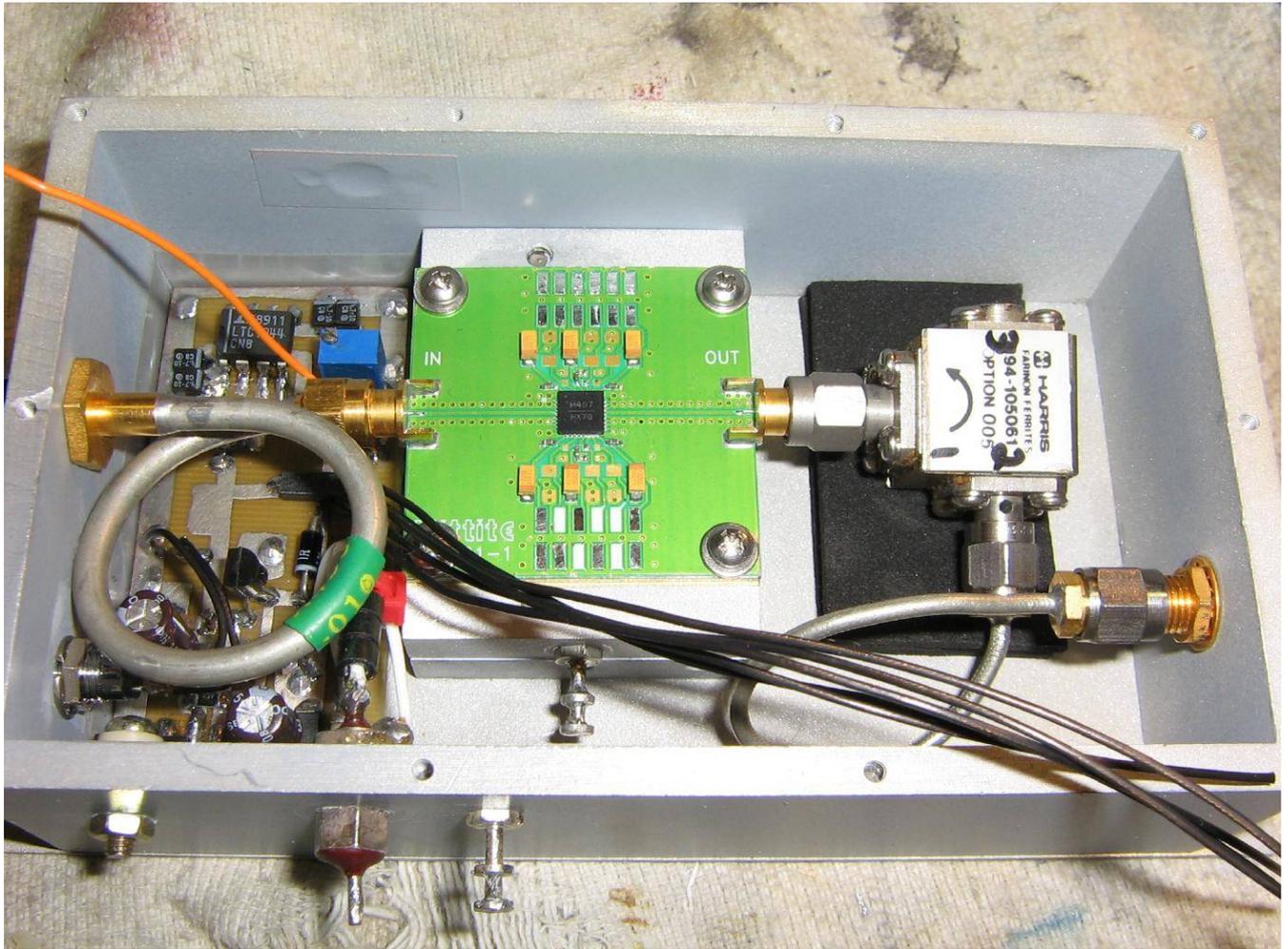
Overview of the Hittite HMC487 evaluation board and the milled aluminum mounting block.

The aluminum blocks were salvaged from other projects, hence the holes in the sides. Two were used in order to make room for an optional RF isolator attached to the RF output of the HMC487.

The block on the right-side has a slot milled to accept the little heatsink on the bottom of the HMC487 evaluation board. Thermal grease was lightly applied to each piece and then the entire assembly is bolted to the bottom of project box.

The brass inserts on that one aluminum block were added when I machined the aluminum down a little too much.

The HMC487 evaluation board has a little 1/4-inch thick aluminum square attached to its bottom to act as a makeshift heatsink, but it's far too small for continuous operation. The idea here is to mill out a slot for this stock heatsink to fit in, then mount this entire assembly to a larger heatsink.



Mounting the evaluation board in the project box.

Four holes were also drilled in the HMC487 evaluation board and the top aluminum block. The holes in the aluminum block were then tapped with #3–48 threads and the evaluation board was secured to the aluminum blocks with #3–48 hardware.

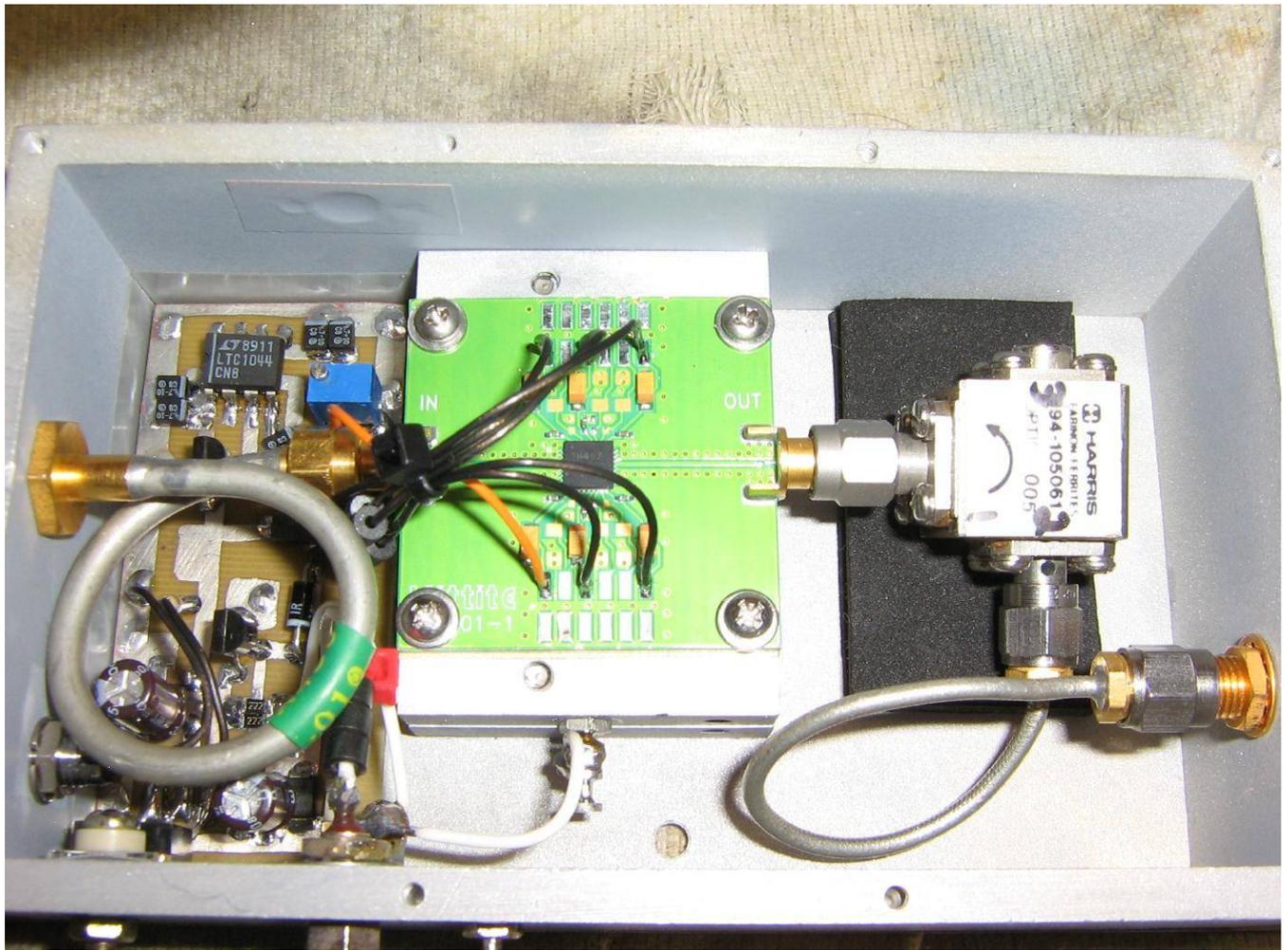
Two #6–32 screws come up from the bottom and secure two aluminum blocks together.

The pin headers were removed from the HMC487 evaluation board to allow the drain and gate wires to be soldered directly to the board. A solder terminal was added to one of the aluminum blocks for the ground.

The +12 VDC input is via the feed-through capacitor on the lower-left. Ground is the solder terminal to the right. There are a couple extra ferrite beads on the incoming +12 VDC wire.

The RF input is on the left-side and comes in via a panel-mounted SMA connector on a salvaged piece of UT-141 coax. The RF output goes through an optional 10 GHz RF isolator (Harris/Farion 94-105061) to protect the HMC487 in the event of an impedance mismatch downline. The final RF output is via a panel-mounted SMA bulkhead.

The RF connectors and conformable coax were all hamfest finds, so it may look a little rough, but everything checked out fine.



Finished overview.

The **BROWN** wires carry the +7 VDC drain voltage. The **ORANGE** wire carries the approximately -0.3 VDC gate bias. The **WHITE** wire is a common ground for everything.

A few pieces of art foam are underneath the 10 GHz isolator to relieve any strain.

Extra ferrite beads were slipped over the wires carrying the drain and gate bias voltages.



Setting the HMC487's negative gate bias and drain quiescent current.

First, attach good 50 ohm loads to the RF input and output of the amplifier.

Then power the amplifier with a quality current meter inline with the incoming +12 VDC power line. Slowly adjust the 500 ohm gate bias potentiometer until the quiescent current reads around 1.3 amps.

The final gate voltage will be around -0.3 VDC. The meter in the above picture is reading -0.256 VDC. Don't exceed -2.0 volts on the gate bias line or the HMC487 will be damaged.



Finished case overview.

RF input is via the SMA connector on the left side.

RF output in on the right side. It passes through an optional 10 dB directional coupler for power monitoring or local oscillator drive on an external mixer.

+12 VDC power is applied via the feed-through capacitor.

For linear operations, you'll want to avoid running the amplifier into compression but for FM, or other constant-envelope modulations, you can let this amplifier hit 2 watts (+33 dBm) of RF output.

Doing this, when combined with a simple 18-inch DSS satellite dish, will make your ERP at least 2,000 watts – at 10 GHz!



v01.0705

HMC487LP5 / 487LP5E

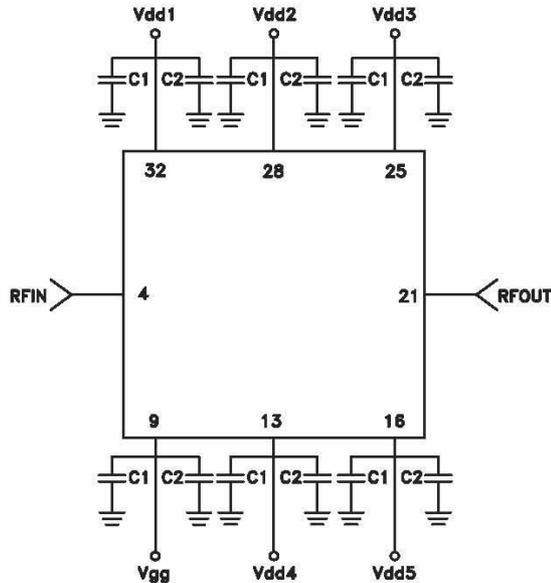
SURFACE MOUNT PHEMT 2 WATT POWER AMPLIFIER, 9 - 12 GHz

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1-3, 5-8, 10-12, 14, 15, 17-20, 22-24, 26, 27, 29-31	N/C	No connection required. These pins may be connected to RF/DC ground without affecting performance.	
4	RFIN	This pin is AC coupled and matched to 50 Ohms from 9 - 12 GHz.	
9	Vgg	Gate control for amplifier. Adjust to achieve I _{dd} of 1300 mA. Please follow "MMIC Amplifier Biasing Procedure" Application Note. External bypass capacitors of 100 pF and 2.2 μF are required.	
21	RFOUT	This pin is AC coupled and matched to 50 Ohms from 9 - 12 GHz.	
32, 28, 25, 13, 16	Vdd1, Vdd2, Vdd3, Vdd4, Vdd5	Power Supply Voltage for the amplifier. External bypass capacitors of 100 pF and 2.2 μF are required.	
	GND	Ground: Backside of package has exposed metal ground slug that must be connected to ground through a short path. Vias under the device are required.	

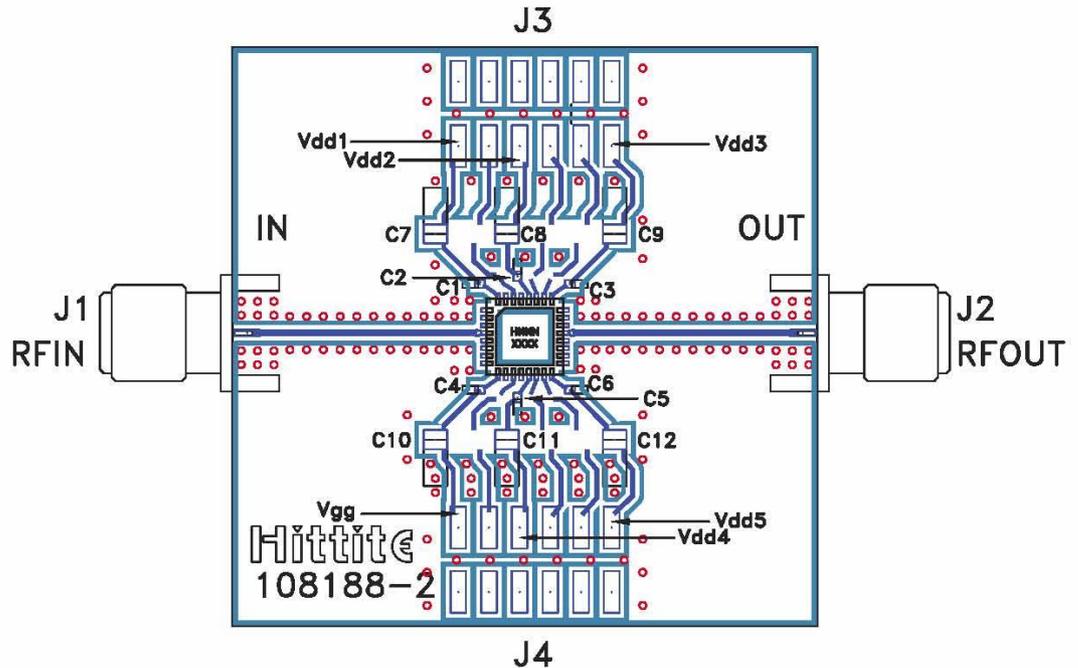
Application Circuit

Component	Value
C1	100 pF
C2	2.2 μF



For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
 20 Alpha Road, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
 Order On-line at www.hittite.com

Evaluation PCB



List of Materials for Evaluation PCB 108190 [1]

Item	Description
J1, J2	SRI PC Mount SMA Connector
J3, J4	2mm DC Header
C1 - C6	100 pF capacitor, 0402 pkg.
C7 - C12	2.2µF Capacitor, Tantalum
U1	HMC487LP5 / HMC487LP5E Amplifier
PCB [2]	108188 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350.

The circuit board used in this application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. Copper filled vias under the device are recommended. The evaluation board should be mounted to an appropriate heat sink. The evaluation circuit board shown is available from Hittite upon request.

Bonus

By [Dave Bullock](#) August 3, 2010 | 7:00 am | Categories: [DefCon](#)

[<< previous image](#) | [next image >>](#)



This pile of cash, roughly \$13,000, was raised for the EFF. A check for \$39,200 was presented to the EFF at the DefCon closing ceremony.

Photo: Dave Bullock/Wired.com

Pages: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) [16](#) [17](#) [18](#) [19](#) [View](#)

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Baa... Baa... Little Sheep

From: www.wired.com/threatlevel/2010/08/gallery-defcon-18/17/

Half of this money will go to corrupt EFF lawyers who want to shut down my *\$2600 Magazine* archives and also want to prevent illegal aliens from showing any valid identification before voting. The other half will go for gas money in their fancy Mercedes and BMWs.

If you're a *real* hacker with some money to burn, you'd be better off sending it to me!

End of Issue #76



Any Questions?

Editorial and Rants



JounoList Members

This is a partial overview of the members of the once-secret JounoList mailing list.

These are the people who used their influence in the media to help elect Obongo and then suppress any scandals which might have hurt his ratings.

Reads like a Tel Aviv phonebook, doesn't it?

THE EVER EXPANDING LIST OF JOURNALIST
"JOURNALISTS," WHOSE E-MAILS SOUND MORE LIKE
THE WAR ROOM AT THE DNC, CONSPIRING TO RATF^CK
ANY OTHER AGENDA BUT THEIR OWN THROUGH THE
GUISE OF IMPARTIAL "JOURNALISM."



EZRA KLEIN

JEFFREY TOOBIN

ERIC ALTERMAN

DAVE WEIGEL



PAUL KRUGMAN

JOE KLEIN

JONATHAN CHIAT

MATTHEW YGLESIAS



SPENCER
ACKERMAN

MICHAEL TOMASKY

THOMAS
SCHALLER

RICHARD KIM



JARED
BERNSTEIN

HOLLY YEAGER

JOE CONASON

DAVID ROBERTS



"I think this has also brought out another very important issue which can now be pointed to with some authority, namely the suppression of news by the corporate media. We should not let this go."

--- Excerpt from an October 16, 2000 posting by Eric Corley on the New York City Indymedia mailing list.

How much do you want to bet that *\$2600 Magazine* will be helping to suppress this *JournoList* story?



"The concept of neutral, objective journalism is no longer. Watergate of epic proportion in the newsroom. If they go after Dave Weigel and Ezra Klein, they are going to have to go after the whole list because it is not just the sins of commission... It is the sins of omission of the rest of the people on the group to watch that strategy play itself out. These people aided in that crime."

— Quote from Andrew Breitbart, one of the few journalists with the balls to cover the suppressed "JournoList" scandal.



From: dailycaller.com/2010/07/21/obama-wins-and-journalists-rejoice/2/

On November 7, 2008, shortly after Obama won the election, a thread on the JournoList mailing list asked others to name those who they were "grateful we no longer have to listen to." Eric Alterman (Jew), author of the book *What Liberal Media?: The Truth About Bias and the News*, responded with: "Fucking Nascar retards."

Just remember – there is no liberal bias in the media!

LOL! Change!

First they lowered the standards for non-Whites in school. Then they lowered the standards for non-Whites in law enforcement. Now they are lowering the standards for medical students! LOL! Get ready for Obama DeathCare!

Getting Into Med School Without Hard Sciences

July 29, 2010 – From: www.nytimes.com

By Anemona Hartocollis

So it came as a total shock to Elizabeth Adler when she discovered, through a singer in her favorite a cappella group at Brown University, that one of the nation's top medical schools admits a small number of students every year who have skipped all three requirements.

Until then, despite being the daughter of a physician, she said, "I was kind of thinking medical school was not the right track for me."

Ms. Adler became one of the lucky few in one of the best kept secrets in the cutthroat world of medical school admissions, the Humanities and Medicine Program at the Mount Sinai medical school on the Upper East Side of Manhattan.

The program promises slots to about 35 undergraduates a year if they study humanities or social sciences instead of the traditional pre-medical school curriculum and maintain a 3.5 grade-point average.

For decades, the medical profession has debated whether pre-med courses and admission tests produce doctors who know their alkyl halides but lack the sense of mission and interpersonal skills to become well-rounded, caring, inquisitive healers.

That debate is being rekindled by a study published on Thursday in *Academic Medicine*, the journal of the Association of American Medical Colleges. Conducted by the Mount Sinai program's founder, Dr. Nathan Kase, and the medical school's dean for medical education, Dr. David Muller, the peer-reviewed study compared outcomes for 85 students in the Humanities and Medicine Program with those of 606 traditionally prepared classmates from the graduating classes of 2004 through 2009, and found that their academic performance in medical school was equivalent.

"There's no question," Dr. Kase said. "The default pathway is: Well, how did they do on the MCAT? How did they do on organic chemistry? What was their grade-point average?"

"That excludes a lot of kids," said Dr. Kase, who founded the Mount Sinai program in 1987 when he was dean of the medical school, and who is now dean emeritus and a professor of obstetrics and gynecology. "But it also diminishes; it makes science into an obstacle rather than something that is an insight into the biology of human disease."

Whether the study's findings will inspire other medical schools to change admissions requirements remains to be seen.

Because MCAT scores are used by U.S. News and World Report and others to rank schools, the most competitive ones fear dropping the test, admissions officials said. And at least two recent studies found that MCAT scores were better than grade-point averages at predicting performance in medical school and on the series of licensing exams that medical students and doctors must take.

"You have to have the proper amount of moral courage to say 'O.K., we're going to skip over a lot of the huge barriers to a lot of our students,'" said Dr. David Battinelli, senior associate dean for education at Hofstra University School of Medicine.

But, Dr. Battinelli added, "Now let's see how they're doing 5 and 10 years down the road." The Mount Sinai study did not answer the question.

There are a few other schools in the United States and Canada that admit students without MCAT scores, but Mount Sinai appears to have gone furthest in eschewing traditional science preparation, said Dr. Dan Hunt, co-secretary of the Liaison Committee on Medical Education, the medical school accrediting agency.

The students apply in their sophomore or junior years in college and agree to major in humanities or social science, rather than the hard sciences. If they are admitted, they are required to take only basic biology and chemistry, at a level many students accomplish through Advanced Placement courses in high school.

They forgo organic chemistry, physics and calculus — though they get abbreviated organic chemistry and physics courses during a summer boot camp run by Mount Sinai. They are exempt from the MCAT. Instead, they are admitted into the program based on their high school SAT scores, two personal essays, their high school and early college grades and interviews.

The study found that, by some measures, the humanities students made more sensitive doctors: they were more than twice as likely to train as psychiatrists (14 percent compared with 5.6 percent of their classmates) and somewhat more likely — though less so than Dr. Kase had expected — to go into primary care fields, like pediatrics and obstetrics and gynecology (49 percent compared with 39 percent). Conversely, they avoid some fields, like surgical subspecialties and anesthesiology.

But what surprised the authors the most, they said, was that humanities students were significantly more likely than their peers to devote a year to scholarly research (28 percent compared with 14 percent). They scored lower on Step 1 of the Medical Licensing Examination, taken after the second year of medical school, which generally correlates with scientific knowledge. But over all, they ranked about the same in honors grades and in the percentage in the top quarter of the class.

Humanities students were also more likely to take a leave of absence for personal reasons, which could reflect some ambivalence about their choices, the study authors said.

Typically, 5 percent to 10 percent of the class drops out before getting to medical school. Those students cannot handle the science or they have changed their minds about their intention to be a doctor, said Miki Rifkin, the program director. One who dropped out was Jonathan Safran Foer, who became an acclaimed novelist.

Dr. Kase founded the Mount Sinai program shortly after a national report on physician preparation questioned the single-minded focus on hard science.

He began with a few students from five colleges and universities that did not have their own medical schools — Amherst, Brandeis, Princeton, Wesleyan and Williams — because, he said, "we did not want to poach."

It has been going full tilt for the past 10 years, and received nearly 300 applications last year from more than 80 colleges across the country, though admissions heavily favor elite schools.

Among undergraduates accepted in 2009, the mean SAT math and verbal score was 1444, and the mean freshman G.P.A. was 3.74. About a third of the class had at least one parent who was a physician; among all medical schools, about one in five has a parent who is a doctor.

Among the current crop is Ms. Adler, 21, a senior at Brown studying global political economy and majoring in development studies.

Ms. Adler said she was inspired by her freshman study abroad in Africa. "I didn't want to waste a class on physics, or waste a class on orgo," she said. "The social determinants of health are so much more pervasive than the immediate biology of it."

She added that her parents, however, were "thrilled when I decided to go the M.D. route, because they were worried about my job security."

A classmate in the program, Kathryn Friedman, 21, graduated from the Chapin School in New York City, before going to Williams, where she is a senior, majoring in political science. Her mother and uncle are doctors at Mount Sinai; her father, Robert Friedman, who works in the entertainment business, is on the Mount Sinai Medical Center board.

The humanities program has allowed her to pursue other interests, like playing varsity tennis and going abroad, she said. When her pre-med classmates hear about the program, she said, "a lot of them are jealous."

She added, "They are, like, 'Wow, I wish I had known about that.'"



A firefighter entrance exam discriminated against minorities?

How can a test discriminate against hard-working White people whose parents are married and who took an extra job to help pay their college tuition?

Oh... Wait... It's those kinds of "minorities."

Hope your shitty, disease-ridden, overpriced NYC apartment complex doesn't catch on fire!

Keep listening to Eric Corley! Keep voting Democrat little sheep! LOL! Change!

Judge Blocks FDNY Hiring

August 4, 2010 – From: www.myfoxny.com

NEW YORK (AP) – The mostly white Fire Department of New York is temporarily barred from hiring more than 300 rookie firefighters because it used an entry exam that discriminates against blacks and Hispanics, a judge ruled Wednesday.

In a written decision in federal court in Brooklyn, U.S. District Judge Nicholas Garaufis said the city had not come up with a good explanation for wanting to hire a new class of firefighters based on an "invalid" test.

"Before the court can permit the city to use (the current exam) in any manner, the city must explain what has changed and why the need to appoint a few hundred rookie firefighters outweighs the need to avoid racial discrimination in municipal hiring," the judge wrote.

The judge's order prohibits any new hiring until Oct. 1. The judge said he would soon schedule a hearing to consider "remedial measures" to meet the city's needs.

A city lawyer, Georgia Pestana, warned in a statement Wednesday that the city will be forced to pay \$2 million per month in overtime to make up for understaffing at the 11,000-member fire department.

"We are extremely disappointed in today's decision and are evaluating all legal options," Pestana said.

The ruling follows earlier setbacks for the city in the lengthy legal dispute with the federal government over discrimination claims. The judge previously found the FDNY had deliberately discriminated against minorities and ordered it to revamp its hiring practices.

The U.S. Department of Justice sued the city in 2007, alleging the fire department was using exams that were littered with SAT-like questions that failed to fairly measure an applicant's ability to fight fires. The lawsuit was prompted by what critics describe as the department's woeful record on minority recruitment when compared with other big city departments.

Your Future

From: angrywhitedude.com

"Today in Atlanta, 30,000 moochers camped out instead of working to get on a waiting list with 400 openings for Section 8 housing. Well, you can safely bet none of these moochers has or wants a job. Section 8 housing is a program that forcibly extracts earnings from producers in America and subsidizes 70% of rent payments for underclass moochers like those in Atlanta. Isn't America great? Productive Americans who have made quality life decisions, gotten educations, exhibit responsibility and work hard can have the government reach into their pockets and take their earnings to give to those who commit crimes, drop out of school, have out of wedlock chirren at 12 years of age. Can anyone say reparations?"

Jobs Homes Apartments Cars Classifieds Kudzu.com ajc.com access

SUE



East Point: Housing applicants turn in forms 4 of 8  



East Point Police Officer J. Fowler directs motorists away from parking along Norman Berry Drive on Thursday. The housing authority was giving out applications on Wednesday because, while all housing units are filled, the waiting list is depleted and applicants will be put on a new waiting list. JOHN SPINK, JSPINK@AJC.COM

More: [More crowd photos](#), [62 injured on Wednesday](#), [Taking housing applications on Thursday](#) | [More Atlanta photos](#)

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From: projects.ajc.com/gallery/view/metro/atlanta/east-point-housing081210/4.html

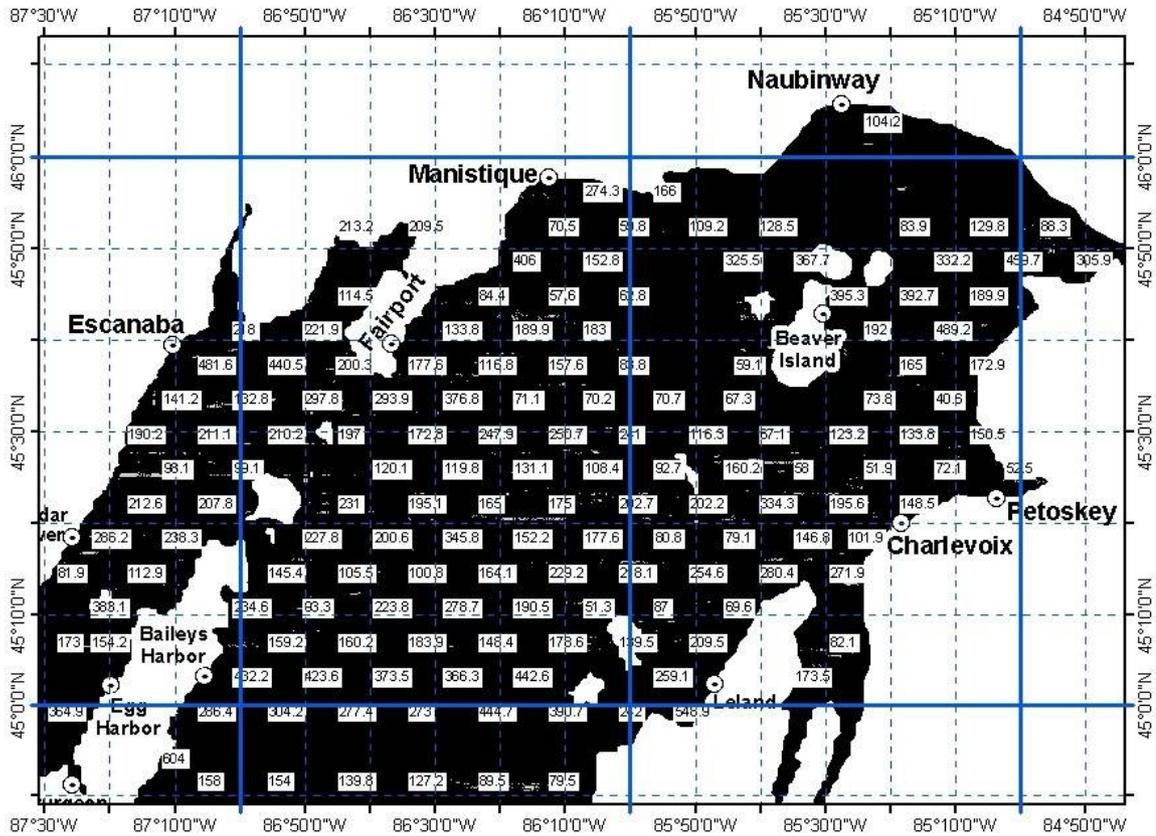
Niggers are always begging for never-ending taxpayer handouts for housing, food, schooling, etc., yet they seem to have no problems paying for the fancy rims on their cars! LOL! Change!

Northern Lake Michigan Surface Temperature

Image Date: 7/4/2010

Image Time: 9:59 (EDT)

Michigan State University Remote Sensing & GIS Research and Outreach Services



Probably Cloudy Cloudy

Each contour line represents one degree (F) change in temperature.

NOT TO BE USED FOR NAVIGATIONAL PURPOSES
Questions? See www.coastwatch.msu.edu/help.html
AVHRR Imagery Provided by NOAA/GLERL CoastWatch Program
PUBLIC DATA NOT FOR SALE

Still don't believe "global warming" evidence is based on fudged data?

Well, official NOAA water surface temperature maps of northern Lake Michigan and the Bay of Green Bay show several points reaching temperatures of over 400° Fahrenheit!

The always reliable (hehe...) *New York Times* just recently ran this story:

Lake Superior, a Huge Natural Climate Change Gauge, Is Running a Fever

www.nytimes.com/cwire/2010/07/19/19climatewire-lake-superior-a-huge-natural-climate-change-83371.html

LOL! Change!