

NO. 3 ESS  
SYSTEM VERIFICATION TELETYPE, AUTOCONNECT AND  
TELETYPE CONTROLLER OPERATION

CONTENTS

- |                                   |                      |
|-----------------------------------|----------------------|
| 1. GENERAL INFORMATION            | 2. TEST EQUIPMENT    |
| 1.1 Description                   | 2.1 Test Sets        |
| 1.2 Sequence                      | 2.2 Test Accessories |
| 1.3 References                    | 3. SETUP             |
| 1.4 Test Records and Requirements | 4. TEST PROCEDURES   |

1. GENERAL INFORMATION

1.1 Description

1.11 Purpose - The purpose of this section is to describe the functions and operation of the local maintenance teletype (TTY), the teletype controllers (TTYC) the teletype line circuit (FB518) and the associated translations and cross connections. It verifies the teletype interface of the No. 3 ESS.

1.12 This section also tests the operation of the 180D data set, the AR17 circuit packs and their ability to function over the DDD network. These tests are imperative so the office can communicate with the PECC and the SCC via TTY to aid in troubleshooting and monitoring.

1.2 Sequence

1.21 This section follows the completion of Section 508. Normally all tests in this section may be completed at this time. At the installer's option the tests marked with a \* may be skipped and completed during operational testing of the No. 3 ESS.

1.3 References

1.31 The following documents will be useful as references during the execution of this section:

<u>Document</u>	<u>Title</u>
BSP 590-001-107	DATA SET 108 - type used with voice grade circuits - reference guide
BSP 591-028-100	DATA SET 108D - and 108E types used in station application description
PA 3H300-01	Office data tables layout specification
IM/OM	
SD-1C905-01	Teletype controller unit circuit
FB518	TTY line circuit
CD-1C905-01	Teletype controller unit circuit
FC21	+3 volt reference and filter circuit
FB494	-48V to +24V converter and power alarm circuit

NOTICE - NOT FOR USE OR DISCLOSURE OUTSIDE THE  
BELL SYSTEM EXCEPT UNDER WRITTEN AGREEMENT

Printed in U.S.A.

<u>Document</u>	<u>Title</u>
FB152	+12V Reference Circuit
FA1058	Tip/Ring Unit Channel Circuit
FA1059	Tip/Ring Line Circuit
FC200	Teletypewriter Controller Interface and Timing Circuits
AR17	EIA Interface
108D	Data Set

#### 1.4 Test Records and Requirements

1.41 The results of the tests of this section shall be recorded on Forms SD-97-1313 and SD-97-1315. For detailed information on filling out test records, see Section 3B, Handbook 3.

1.42 The tests in this section are based on the No. 3 ESS performance requirements BSP 820-650-180.

## 2. TEST EQUIPMENT

### 2.1 Test Sets

2.11 The following test sets will aid in troubleshooting faulty circuits:

<u>Amt.</u>	<u>ITE</u>	<u>Description</u>
1	5237B	Tektronix 465 Oscilloscope

## 3. SETUP PROCEDURES

3.1 The system should be running in generic with both CUs normal and in the duplex mode.

## 4. TEST PROCEDURES

4.1 Perform each step in the following tables in order except where indicated. Where an output response is indicated, the required response should be looked up in the output message manual to verify that the constants in the variable field of the printout are correct for the message typed in.

4.2 All typed message unless otherwise indicated are to be typed on the maintenance TTY.

4.3 The following table tests the local maintenance TTYC and the alternate local maintenance TTYC.

TABLE 1

STEP	PROCEDURE	NORMAL RESPONSE	FAILURE INDICATION	COMMENTS
1	PRESS PWR KEY TTYCO & TTYC1	MAINT TTY RUNS OPEN		
2	REMOVE ALL AR17 AND 108D DATA SETS TTYCO & TTYC1 EXCEPT TTYCO PORT 0			
3	PRESS PWR KEY TTYCO & TTYC1	MAINT TTY OPERATES NORMALLY	MAINT TTY RUNS OPEN; VERIFY AR17 TTYCO PORT 0	
4	PRESS TTY INIT KEY SYSTEM STATUS PNL			
5	TYPE-DGN:TTYC 0!	TTYC DGN TTYC 0 ATP	TT DGN TTYC 0 ABT TT DGN TTYCO STF	ALL CIRCUIT PACKS OF TTYCO SHOULD BE REPLACED ONE AT A TIME TO ISOLATE THE FAILURE

TABLE 1 Cont'd)

STEP	PROCEDURE	NORMAL RESPONSE	FAILURE INDICATION	COMMENTS
6	TYPE-DGN:TTYC 1!	TT DGN TTYC1 ATP	TT DGN TTYC1 ABT	ALL CIRCUIT PACKS
7	TYPE - SW SYC!		TT DGN TTYC1 STF	OF TTY1 SHOULD BE REPLACED ONE AT A TIME TO ISOLATE THE FAILURE
8	PRESS TTY INIT KEY SYS STAT PNL			
9	TYPE-DGN:TTC 0!	TT DGN TTYC 0 ATP	TT DGN TTYC 0 ABT TT DGN TTYC 0 STF	ALL CKT PACKS OF TTYC 0 SHOULD BE REPLACED ONE AT A TIME TO ISOLATE THE FAILURE
10	TYPE-DGN:TTYC 1!	TT DGN TTYC 1 ATP	TT DGNTYC 1 ABT TT DGN TTYC 1 STF	ALL CKT PACKS OFF TTYC 1 SHOULD BE REPLACED ONE AT A TIME TO ISOLATE THE FAILURE
11	REINSERT THE AR17 CKT PACK INTO TTYC 1 PORT 0			THIS IS THE ALTERNATE LOCAL MAINT TTY PORT
12	REMOVE THE PLUG CONNECTING THE LOCAL MAINT TTY TO TTYC 0 PORT 0 AND RECONNECT IT TO TTYC 1 PORT 0			
13	PRESS THE TTY INIT KEY SYS STAT PNL			
14	TYPE-OP:CLK!	OP CLK DAY MM/DD/YY HH:MM:MM XXXXXXXX		FAILURE INDICATES PROBLEM IN TTYC 1 OR CABLES TO ONLINE SYC
15	TYPE-SW SYC!			
16	TYPE-OP:CLK!	OP CLK DAY MM/DD/YY HH:MM:SS XXXXXXXXXXXX		FAILURE INDICATES PROBLEM IN CABLES TO ONLINE SYC
17	RESTORE THE PLUG FOR THE LOCAL MAINTENANCE TTY TO TTYC 0 PORT 0			

4.4 The following table tests the remote maintenance TTY channel and its dedicated line to the SCC. It also tests the switching to the TTY line circuit (FB518).

TABLE 2

STEP	PROCEDURE	NORMAL RESPONSE	COMMENTS
1	VERIFY THAT TTYC 0 PORT 1 AND TTYC 1 PORT 1 ARE EQPT WITH 108D DATA SETS. VERIFY THAT THESE PORTS ARE CROSS CONNECTED AT THE CDF TO THE TTY LINE CIRCUIT AND THAT THE TTY LINE CIRCUIT IS CROSS CONNECTED AT THE CDF TO A DEDICATED LINE TO THE SCC.		
2	VERIFY THAT THE SCC IS MONITORING THE NO. 3 ESS AT THE SCC		
3	REQUEST THAT THE SCC TYPE -	OP CLK DAY MM/DD/YY HH:MM:SS XXXXXX	FAILURE INDICATES SCC TTY NOT PROPERLY EQPT DEDICATED LINE FACILITY PROB ERROR IN WIRING OR CROSS CONNECT ERROR IN TRANSLATION CKT PACK 108D OR PORT CKT NOTE: CARRIER FAIL LAMP ON 108D TTYC 0 PORT 1 SHOULD BE OUT
4	PRESS ALARM TRANSFER KEY SYC STAT PNL		
5	PRESS THE PWR KEY TTYC 0	MAINT TTY SHOULD RUN OPEN	
6	REQUEST THAT THE SCC TYPE - OP:CLK! AT THE REMOTE	OP CLK DAY MM/DD/YY HH:MM:SS XXXXX (VER AT SCC)	FAILURE INDICATES ERROR IN WIRING OR CROSS CONNECT TTY LINE CKT PROBLEM NOTE: CARRIER FAIL LAMP ON 108D TTYC 1 PORT 1 SHOULD BE OUT
7	PRESS THE PWR KEY TTYC 0		
8	PRESS THE ALARM TRANSFER KEY SYS STAT PNL		



TABLE 3 (Cont'd)

2	RC:AC/ TYP NEW/ TN XXX XXXX/ TRIGGER TELEPHONE NUMBER RTN X XXX XXX XXXX/ RETURN TELEPHONE NUMBER (UP TO 11 DIGITS) I.E. TELEPHONE NUMBER OE XXXXX/ OE OF THE TTY CONTROLLER LINE CKT DIALED BY THE NO. 3 ESS CLS X/ TTY MESSAGE CLASS SEE BELOW TO ATT/ TIME OUT IN SECONDS AUTO/ IF AUTO AUTOCONNECT I.E. NO TRIGGER NO. FUN X/ FUNCTION SEE BELOW TTYC X/ TTY CONTROLLER NUMBER PORT X/ PORT OF THE TTYC END!  TTY MESSAGES CLASSES AXXX 0 MAINTENANCE 1 REMOTE MAINTENANCE (SCC) 2 SERVICE ORDER 3 TRAFFIC 4 REPAIR SERVICE BUREAU 5 OFFICE RECORDS 6 AMARC PRIMARY CHANNEL 7 AMARC BACKUP CHANNEL  FUNCTION 0 TTY NOTE: USED TO AUTOCONNECT A TTY 1 AMARC NOTE: USED TO CONNECT TO A AMARC CENTER 2 EADAS NOTE: USED TO CONNECT TO AN EADAS 4 LTD NOTE: USED TO CONNECT A LOCAL TEST DESK TO THE NO. 3 ESS LOCAL TEST DESK TRUNK
---	---

TABLE 4

RECENT CHANGING AUTOCONNECT  
GENERIC SO-2 ISSUE 4

TO REMOVE AUTOCONNECT TRANSLATIONS

1	RC:LINE TYP OUT/ ORD XXX/ TN XXX XXXX/ TRIGGER TELEPHONE NUMBER OE XX XXX/ ALL AUTOCONNECT LINES USE THE OE OF THE TTY LINE CIRCUIT END!
---	---

TO INSERT A TRIGGER TELEPHONE NUMBER

```

RC:LINE/
ORD oooo/
TYP tt/
TN nxx xxxx/
OE gg twsi/
LCC tt/
IP p ddd t
RTN nxx xxxx/
CLS n/
TTYC n/
PORT n/
AUTO YES or NO/
TO nnn or NO/
PRIOR hn/
TONE n/
ETYP n/
TER n/
RMK oooooooooooooo/
END!

```

TABLE 4 (Cont'd)

This message is the recent change message for customer line service orders. It is used to add, change, or remove individual line information. This includes autoconnect lines with single trigger numbers.

This recent change is active immediately upon successful completion of the message.

This is a linked message. The first input line is followed by several message segments, each consisting of a keyword and keyword data followed by a continue character (/). These segments may be entered in any order. The last input line must be "END!" or a keyword and its corresponding data followed by an execute character (!).

Each keyword is explained below:

ORD booo

ORDer number: The range is from 0 through 9999.

TYP ttt

TYPe of service order. The three types for ttt are:

NEW - define a NEW entry  
CHG - CHAnGe an existing entry  
OUT - remove an existing entry

TN nxx xxxx

Telephone number: The data is all numeric (decimal).

OE gg\_cwsi

Terminal equipment number:

This keyword is required except for TNs on intercept and TNs used for special routing.

gg = concentrator group (01 through 15)  
c = concentrator (0 through 1)  
w = switch group (0 through 2)  
s = switch (0 through 7)  
i = input level (0 through 7)

For Issue 3 generic only, only one autoconnect trigger number may be associated with an autoconnect OE via RC:LINE. Additional trigger numbers must use a dummy OE. In Issue 4 or later generics, the additional trigger numbers must use the autoconnect OE.

LCC ttt

Line Class Code:

This specifies what originating major class, terminating class, and screening class a line will have. Keyword RAX is used with LLC to determine the classes. If RAX is not specified, RAX is assumed to be zero.

DP p\_ddd\_t

Distributor Triplet: Use to provide a "sleeve lead" function. This keyword is not allowed if keyword DPU is specified.

p = peripheral pulse distributor (0 through 1)  
ddd = peripheral decoder (000 through 255)  
t = triplet (0 through 3)

To remove the distributor point, specify NO in the data field.  
The value 0 0 000 is not allowed.

RTN npa\_nxx xxxx

Return Telephone Number:

This is the telephone number that will be automatically called by No. 3 ESS to establish a connection to this channel.

TABLE 4 (Cont'd)

## CLS\_n

## Message Class:

- n = a number from 0 to 7 specifying the TTY message class that will be assigned to this channel.
- = 0 maintenance
- = 1 remote maintenance
- = 2 service orders
- = 3 traffic
- = 4 LTD or repair service bureau
- = 5-7 reserved

## TTYC\_n

## TTY Controller Number:

- n = a number from 0 to 7 specifying the TTY controller for this message class.

## PORT\_n

## TTY Port Number:

- n = a number from 0 to 3 specifying the TTY port number for this message class.

## AUTO\_ttt

## Automatic Dialup Option:

- ttt = YES if automatic dialup is desired. If this option is chosen, No. 3 ESS will automatically call the RTN whenever a message is ready for printing on the channel even if the trigger number was not dialed previously.

To remove automatic disconnect, specify 0 or NO.

## TO\_nnn

## Time Out:

- nnn = Number of seconds that TTY channel can remain idle waiting for input before automatic disconnect.

## PRIOR\_nn

## Priority:

- nn = 0 through 15
- Lowest priority is 0, highest priority is 15.
- This keyword is reserved for future use.

## NOB\_YES\_or\_NO

## No Dial-Back:

- This keyword is reserved for future use.

## TONE\_n

## Carrier Tone:

- This defines the carrier tone of the data set.
- n = 0 high tone- normal autoconnect TTY or LTD
- = 1 2225 Hz tone - time 10 seconds
- (Answer tone for 212a data set)

## ETYP\_n

## Function:

- n = 0 TTY
- = 1 AMA
- = 2 EADAS
- = 3 spare
- = 4 LTD
- = 5 RRA
- = 6 spare
- = 7 spare

## TER\_n

Member number in LTD trunk group.

Required keyword when CLS = 4.

## END

## END of message:

Indicates that no more data follows.

The preceding message should be performed. END must be followed by the standard execute character (!). The end can also be signaled by following the last keyword typed by the execute character. Otherwise all keywords should be followed by the continue character (/).

TABLE 5

RECENT CHANGING AUTOCONNECT  
RC:TTY MESSAGE

RC:TTY/

TYP ttt/	Always required
TTYC n/	Always required
CLS n/	(Issue 4 or later generics only)
PORT n/	
SC mm ss/	(Issue 1, 2 and 3 generics only)
OE gg cws i/	(Issue 1 and 2 generics only)
OP p ddd t/	(Issue 1 and 2 generics only)
HS YES or NO/	(Issue 4 or later generics only)
PAR ttt/	
WRU ttt/	
RO ttt/	(Issue 1, 2 and 3 generics only)
MON ttt/	(Issue 4 or later generics only)
END!	

This message is used to change a TTY controller or port. A controller can be added or deleted, or its I/O subchannel (Issue 1, 2 and 3 generics only) and parity characteristics can be changed. A port can be added or deleted, or its answer-back and send-receive characteristics can be changed. For Issue 1 and 2 only, if the port has the autoconnect capability, its network terminal and distribute points can also be defined or changed. The TTYC can be deleted only after ALL ports have been deleted.

This recent change is active immediately upon successful completion of the message.

This is a linked message. The first input line is followed by several message segments, each consisting of a keyword and keyword data followed by a continue character (/). These segments may be entered in any order. The last input line must be "END!" or a keyword and its corresponding data followed by an execute character (!).

Each keyword is explained below:

TYP\_ttt

TYPE of service order. The three types for ttt are:

- NEW - define a NEW TTYC or PORT
- CHG - CHanGe an existing TTYC or PORT
- OUT - remove an existing TTYC or PORT

TTYC\_n

TTY Controller Number:

n = A number from 0 to 7 specifying the physical TTY controller.

For Issue 1, 2 and 3 generics:

N = a number from 0 to 4 specifying the message class.

CLS\_n (Issue 4 or later generics only)

Message Class:

n = 1-digit number defining the message class

- 0 - Maintenance
- 1 - Maintenance back-up
- 2 - Service order
- 3 - Traffic
- 4 - Repair service bureau

NOTE: Issue 3 generic CLS equals the TTYC number. However, any CLS can autoconnect to TTYC 0 or TTYC 1

TABLE 5 (Cont'd)

## PORT\_n

TTY Port Number:

n = A number from 0 to 3 specifying the TTY port.

This item is used only if a port is being added, deleted, or changed.

## SC\_mn\_ss

TTY controller I/O address:

mm = main channel number (00-19)

nn = subchannel number (00-19)

This item is used only if a new TTY controller is being defined or an existing controller is being moved to a different subchannel.

## OE\_gg\_cwsl (Issue 1 and 2 generics only)

TEN of Autoconnect Line

## DP\_p\_ddd\_t (Issue 1 and 2 generics only)

Specify the DP of TTY line circuit.

## HS\_YES or\_NO (Issue 4 or later generics only)

High Speed TTY

IF HS = YES, entry is defined as a high-speed device.

IF HS = NO, high-speed definition is removed.

For Issue 4 generic, controllers 2 and 3 are dedicated for High Speed. Other auxiliary controllers (4 or 6) may or may not have the High Speed feature depending on the intercept they are connected to. Intercept 12 is for High Speed.

## PAR/ttt

Parity check option:

ttt = YES if all input characters are to be checked for even parity

## WRU\_ttt

Answer-back option:

ttt = YES if this port is to be tested via the WRU-ACK sequence

This item is used only when defining or changing a TTY port.

## RO\_ttt (Issue 1, 2 and 3 only)

Receive-only option:

ttt = YES if this port is receive-only and cannot supply input messages

## MON\_ttt (Issue 4 or later generics only)

MONitor option:

YES if this port is monitor and its port status will follow the status of ports 0 and 1. This is NOT a receive only option. Receive only is only achieved via the hardware.

## END

END of message:

Indicates that no more data follows.

The preceding message should be performed. END must be followed by the standard execute character (!). The end can also be signaled by following the last keyword typed by the execute character. Otherwise all keywords should be followed by the continue character (/).

- 4.55 The following procedure in use to test autoconnect:

TABLE 6

1.	VERIFY THAT EACH PORT OF THE TTYC TO BE TESTED IS EQUIPPED WITH THE CORRECT DATA SET
2.	VERIFY THAT THE REMOTE TTY IS EQUIPPED AND CAPABLE OF RECEIVING CALLS
3.	VERIFY THAT AN OUTGOING TRUNK FROM THE NO. 3 ESS IS AVAILABLE TO HANDLE THE CALL TO THE REMOTE TTY
4.	DIAL THE TRIGGER NUMBER FROM A TELEPHONE IN THE NO. 3 ESS, WAIT FOR TONE AND HOLD CALL FOR TEN SECONDS
5.	VERIFY THAT CALL IS RECEIVED BY REMOTE TTY AND APPROPRIATE MESSAGE IS PRINTED
6.	IF AUTO AUTOCONNECT VERIFY OPERATION OF THE REMOTE TTY

Manager, ESS Installation & Field Engineering

4-21-78