FS 1
RECEIVER CIRCUIT

P/O CP1 EXCEPT AS OTHERWISE INDICATED

P/O CM1

R1 RCV 0-2dB 200 — CW 3, 2, 1

R2 115K SEE NOTE 104

R3 23.2K

R4 168

R5 6190

R6 1980

R7 298

R8 6190

R9 298

C1 .01

C2 .01

IC1-A 559A

CR8

T1

J1 R1 — TO SUBSCRIBER LOOP -4 TO +6 TLP

J2 T1

S1 OPEN 1200 600 150 OPEN 3D1 1200 600 150

E1 E2 E3 E4 E5

0, 1, 2, 4, 8 dB AT

TG 6 — 4G — CR1 — P/O P1 41 — RC(N) TO TPU CKT

P/O J3 RCV — E6 E7 E8 E9 — +2.5dB TLP

NC

IC2 RECEIVE ACTIVE FILTER 525E

P/O P1 25 RPAM RCV — 49 RPAM MG — TO RECEIVE UNIT CKT

366 RC

C3 4990 PF — R10 499 — Q1 — C4 100 PF — R11 49.9K — R12 40.2K — R13 2.49K

R46 27.1 — -12

R52 18 — +12

P/O P1: 32 SG — 33 -48SP — 8 FG — 7 -48F — 26 FRAME — 23 -12 — 22 12G — 48 4G — 50 +4 — 2 20Hz

TO TPU CKT — TO FUSE ALARM & FILTER CKT — TO FRAME GRD — TO POWER CONVERTER CKT

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT	SD-3C217-01-BI
BELL TELEPHONE LABORATORIES INCORPORATED	6S

FS2
TRANSMITTER CIRCUIT

P/O CM1
Y R64 (SEE NOTE 108) 51.1K
Z R14 SEE NOTE 105 1.04M
Z R15 53.6K
+12
C5 .01 12G
0,1,2,4,8 dB AT2
P/O J3 XMT
-7.5dB TLP
R16 6190
IC1-C 559A
R19 600
R20 6190
12G
-12
C6 .01
126
E16
E17
CW
R18 XMT 0-24B 200
P/O CP1 EXCEPT AS OTHERWISE INDICATED
E14
E15
R21 768
R22 1690
R23 768
R24 193
R25 102
R26 102
R27 681
126
NC
IC3 TRANSMIT ACTIVE FILTER 525F
E18
E19
C8 .01
C9 .01
+12
-12
Z1 TRANSMIT GATE CIRCUIT ED-3C414-30
2.15
2K
PULSE AMP.
P/O P1
TPAM
XMT
TPAMG
TO TRANSMIT UNIT CKT
365 TC
C10 1000 PF
P/O CM1
C11 2.2
R
J4
P/O P1
29
E10
S2
OPEN
1200
600
150
OPEN 3A1
TO SUBSCRIBER LOOP
-13 TO -3 TLP
T
J5
E11
T2
LF C.5 SCR SW
E12
E13
3 CW
R17 RLF 3K
C25 SCR SW
C.5 SCR SW
C1 SCR SW
C2 SCR SW
C7
F .5
E .25
D .5
C 1.0
A 1.0
B 1.0
G .25
H .25
L1 .774 MH
RV3
RV4
HF SCR SW
E26
E20
R28 RHF 5K
CW
P/O CM1
NC
IC1-B 559A
NC
NC
126

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT

SD-3C217-01-B2

BELL TELEPHONE LABORATORIES INCORPORATED

SHEET 6S

SHEET 5B

FS3
SIGNALING CIRCUITS

P/O CP1 EXCEPT AS OTHERWISE INDICATED

C12 200 · R33 100 · 20Hz · R30 200 · TG 1 · 232 b · 3 RNG · Z2 · FG · R34 200 · R36 20K · RV5 · C14 0.1 · -48F · R44 200 · R41 20K · TG 4 · 111 RG 1L 915 · Z3 · 102 c · 2 RNG

RX SCR SW (SEE NOTE 107) · R40 600 · TG2 · 20Hz RINGING · P/O P1 1 · RG 1

P/O CM2: R37 10K · R38 14.9K · R39 24.9K · R63 511 · RV6 · R42 20K · Q3 · Q4 · Q5 · R45 1K · RV7 · FG

FG · R29 147 · R31 4700 · -48F · Q2 · R32 5.11K · R35 33.2K · C13 10 · 20Hz

R48 10K · R49 1.24K · +4 · Q6 · R50 1K · C15 10 · Q7 · R47 1.5K · 4G

RNG 1L 1U 2100 CR3 · -48SP · R51 150 · TG 3 · CR4 · CR5 · CR6 · BB SCR SW (SEE NOTE 106) · 5 BB · TO TPU CKT

P/O CM2: Q8 · R53 51.1K · -48SP · SG · Q9 · Q10 · R54 10K · R56 1.24K · +4 · R58 1.5K · 4G · C16 SG 40 · 1U TG 2100 1L

P/O CM2: R55 150 · CR7 · 31 BG · Q11 · Q12 · R59 36.5K · -48SP · Q13 · R61 10K · R62 1.24K · +4 · R60 1.5K · 4G

TG 5 · 4G · P/O CM2 R43 1.96K · +4

IC4 CHANNEL UNIT LOGIC

TO RECEIVE UNIT CKT	RNWD	16
	RQ(A)	17
	RQ(B)	40
	RNSA	12
	RNSB	13
	RNFA	37
	RNFB	38
TO TRANSMIT UNIT CKT	TNWD	20
	TQ(A)	19
	TQ(B)	44

TNSA 11 · TNSB 10 · +4 · R57 5.11K · 4G

23 RNDB · 5 RNDA · 4 RC 1E5 · TC 2F6 · 13

P/O P1 42 TNA TO XMSN MON. UNIT

43 TC TO XMSN MON. UNIT CKT

P/O P1 6 9 14 15 21 19 TNB TNA TNEN TO TRANSMIT UNIT CKT

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT

SD-3C217-01-B3

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-3C217-01-B3

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
BATTERY SYMBOL		VOLTAGE RANGE	

102.

FEATURE OR OPTION	PROVIDE		
	APP FIG	APP OR WRG	QUANTITY

103.

RECORD OF APP FIGURES, WIRING AND APPARATUS CHANGES						
CHANGED ON ISSUE	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT		
				STD	A&M	MD
4B	Z OR Y	Z		Y		Z

CIRCUIT NOTES (CONT)

104. SELECT R2 DURING MANUFACTURE TO MEET GAIN REQUIREMENTS, 115K NOMINAL WITH 100K MIN. AND 180K MAX.

(MFR DISC) 105. SELECT R14 DURING MANUFACTURE TO MEET GAIN REQUIREMENTS, 1.04M NOMINAL, 400K MIN. AND 2.5M MAX.

106. SCREW SWITCH "BB" SHALL BE CLOSED WHEN CHANNEL UNIT IS CONNECTED TO A TRUNK CIRCUIT WHICH REQUIRES TIP GROUND DURING A CARRIER FAILURE.

107. SCREW SWITCH "RX" SHALL BE CLOSED FOR SUBSCRIBER LOOPS OR PBX TRUNKS LONGER THAN 600 OHMS.

108. THIS RESISTOR IS TO BE SELECTED AT MANUFACTURE TO MEET GAIN REQUIREMENTS. IF THE RESISTOR VALUE OF R64, SHOWN ON SHEET B2 IS INADEQUATE, A VALUE MAY BE SELECTED FROM AMONG THE FOLLOWING. RS-2081QL1A RESISTORS: 49.9K, 50.5K, 51.7K OR 52.3K.

EQUIPMENT NOTES:

201. "PI" INDICATES PRINTED CONNECTOR FINGERS OF PWB PLUG END AND MATES WITH A 940A CONNECTOR.

202. DESIGNATIONS SHOWN IN BOLD CHARACTERS IN B SECTION ARE MARKED ON UNIT.

203. TO CLOSE A SCREW SW TCH, THE SCREW SHALL BE TIGHTENED SUFFIC ENTLY TO INSURE CONTACT BETWEEN TERMINALS AND UNDERSIDE OF SCREW HEAD. CAUTION IN TIGHTENING SCREW IS RECOMMENDED TO AVOID SHEARING OF SCREW. TO OPEN A SCREW SWITCH, THE SCREW SHALL BE LOOSENED APPROXIMATELY TWO COMPLETE TURNS. THE UNITS SHALL BE SHIPPED WITH SCREW SWITCHES SET AS SHOWN IN TABLE A AND SLIDE INDEX ATTENUATORS SET FOR MAXIMUM ATTENUATION AND ALL POTENTIOMETERS SET TO "0". ALL OTHER CONTROLS SHOULD BE IN FINAL TEST POSITION.

TABLE A

DESIG	SCREW SWITCH SETTING
RX	OPEN
BB	OPEN
LFC.5, C.25, C.5, C1, C2	CLOSED
HF	OPEN

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS
CAPACITANCE VALUES ARE IN MICROFARADS
VALUES PRECEDED BY THE SYMBOL (+) PLUS OR (-) MINUS ARE IN VOLTS.

5B

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT

SD-3C217-01-D1

BELL TELEPHONE LABORATORIES INCORPORATED 6S

APP FIG. 1

CONNECTOR

DESIG	LOC	CODE
R1(J1)	1C0	KS-20667,L13
T1(J2)	1D0	KS-20667,L9
[1] RCV(J3)	1C9	
XMT(J3)	2C9	601A
R(J4)	2C0	KS-20667,L13
T(J5)	2D0	KS-20667,L9

JACK

SEE CONNECTOR

POTENTIOMETERS

DESIG	LOC	CODE
R1	1B4	KS-21423,L5,200
R17	2C3	KS-21423,L3,3K
R18	2C5	KS-21423,L5,200
R28	2G5	KS-21423,L4,5K

CIRCUIT PACK

DESIG	LOC	CODE
CP1	1B5,2C4,3A4	ED-3C479-( )

E/W
RELAY

DESIG	RG		RNG		TG	
CODE	MA4A		MA35A		MB21A	
	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC
12						
11						
10						
9						
8						
7						
6					EMB	1C7
5					EMB	3E4
4	EMB		EMB		EBM	3C2
3	EBM		EBM	3B2	EBM	3E6
2	EBM		EBM	3D2	EBM	3E2
1	EBM	3F2	EMB		EMB	3B1
COIL		3D2		3D7		3E7

ATTENUATOR

DESIG	LOC	CODE
AT1	1C5	50E
AT2	2B8	50E

CAPACITOR

DESIG	LOC	CODE
C3	1G5	KS-16742,L27,4990PF
C4	1F7	KS-16958,L31,100PF
C6	2C6	KS-19774,L2,.01
[1] C7,A-H	2D3	734F CAP PAK
C8	2E6	KS-19774,L2,.01
C9	2E6	KS-19774,L2,.01
C10	2F6	KS-16742,L27,1000PF
C12	3A2	KS-19524,L15,200
C13	3B5	601M,10
C15	3E5	610B,10
C16	3E7	KS-19524,L13,40

DIODE

DESIG	LOC	CODE
CR1	1C8	458C
CR3	3E7	458A
CR4	3E7	458A
CR5	3E6	458C
CR6	3E7	458A
CR8	1D2	521B

CIRCUIT PACK (CONT)

INDUCTOR

DESIG	LOC	CODE
L1	2D5	16228S,5.74MH

INTEGRATED CIRCUIT

DESIG	LOC	CODE
IC2	1D7	525E
IC3	2D7	525F
IC4	3F3	129E

NETWORK

DESIG	LOC	CODE
Z1	2F7	ED-3C414-30
Z2	3B2	186A
Z3	3D2	186A

RESISTOR

DESIG	LOC	CODE
R4	1C4	KS-20810,L1A,768
R5	1D3	KS-20810,L1A,6190
R6	1D4	KS-20810,L1A,1980
R7	1D2	KS-20810,L1A,298
R8	1D3	KS-20810,L1A,6190
R9	1E2	KS-20810,L1A,298
R10	1G6	KS-20810,L1A,499
R11	1G7	KS-20810,L1A,49.9K
R12	1G6	KS-20810,L1A,40.2K
R13	1G7	KS-20810,L1A,2.49K
R21	2D5	KS-20810,L1A,768
R22	2D5	KS-20810,L1A,1690
R23	2D5	KS-20810,L1A,768
R24	2E5	KS-20810,L1A,193
R25	2E4	KS-20810,L1A,102
R26	2E5	KS-20810,L1A,102
R27	2E5	KS-20810,L1A,681
R29	3A5	KS-20810,L1A,147
R30	3B2	KS-20289,L6C,200
R31	3A5	KS-20289,L6C,4700
R32	3B4	KS-20810,L1A,5.11K
R33	3B2	KS-20289,L6C,100
R34	3C2	KS-20289,L6C,200
R35	3B4	KS-20810,L1A,33.2K
R40	3E1	KS-20289,L6C,600
R44	3C2	KS-20289,L6C,200
R46	1G2	KS-20810,L1A,27.1
R47	3E5	KS-20810,L1A,1.5K
R48	3D6	KS-20810,L1A,10K
R49	3D6	KS-20810,L1A,1.24K
R50	3D5	KS-20810,L1A,1K
R51	3D6	KS-20810,L1A,150
R52	1G3	KS-20810,L1A,18
R54	3F5	KS-20810,L1A,10K
R56	3F6	KS-20810,L1A,1.24K
R57	3F2	KS-20810,L1A,5.11K
R58	3F5	KS-20810,L1A,1.5K
R60	3G5	KS-20810,L1A,1.5K

SWITCH

DESIG	LOC	CODE
S1	1C1	KS-19104,L18
S2	2C1	KS-19104,L18

CIRCUIT PACK (CONT)

SELECTOR BLOCK

DESIG	LOC	CODE
BB	3E8	840844039
RX	3E1	840844039
[1] MF	2G5	L-900603-1
LF C.5	2C2	
C.25	2C3	
C.5	2C3	
C1	2C4	
C2	2C4	

TRANSFORMER

DESIG	LOC	CODE
T1	1C1	25788A
T2	2C1	25788A

TRANSISTOR

DESIG	LOC	CODE
Q1	1G6	66J
Q2	3B5	51C
Q6	3D6	51A
Q7	3E5	66G
Q9	3E5	51A
Q10	3F5	66G

VARISTOR

DESIG	LOC	CODE
RV3	2D5	106A
RV4	2D5	100A

CIRCUIT MODULE

DESIG	LOC	CODE
CM1	1B3,2A6, 2E3,2G7	ED-3C492-( )

E/W

CAPACITOR

DESIG	LOC	CODE
C1	1C3	KS-19774,L2,.01
C2	1D3	KS-19774,L2,.01
C5	2B6	KS-19774,L2,.01
C11	2G7	KS-20736,L2,2.2

INTEGRATED CIRCUIT

DESIG	LOC	CODE
[1] IC1A	1D3	559A
IC1B	2F3	
IC1C	2C6	

RESISTOR

OPTION	DESIG	LOC	CODE
	R2	1B3	KS-20810,L1A,15K(SEE NOTE 104)
	R3	1C3	KS-20810,L1A,2.2K
Z	R14	2A6	KS-20810,L1A,2M (SEE NOTE 105)
Z	R15	2B6	KS-20810,L1A,6K
	R16	2B6	KS-20810,L1A,190
	R19	2C7	KS-20810,L1A,10
	R20	2C6	KS-20810,L1A,40
Y	R64	2A6	KS-20810,L1A,51.1K (SEE NOTE 108)

CIRCUIT PACK (CONT)

CIRCUIT MODULE

DESIG	LOC	CODE
CM2	3B3,3E5 3E6,3F6	ED-3C491-( )

E/W

CAPACITOR

DESIG	LOC	CODE
C14	3C3	KS-19774,L5,0.1

DIODE

DESIG	LOC	CODE
CR7	3F8	458A

RESISTOR

DESIG	LOC	CODE
R36	3C2	KS-20810,L1A,20K
R37	3B4	KS-20810,L1A,10K
R38	3B5	KS-20810,L1A,14.9K
R39	3C4	KS-20810,L1A,24.9K
R41	3C2	KS-20810,L1A,20K
R42	3C5	KS-20810,L1A,20K
R43	3E5	KS-20810,L1A,1.96K
R45	3D4	KS-20810,L1A,1K
R53	3E6	KS-20810,L1A,51.1K
R55	3F7	KS-20810,L1A,150
R59	3F7	KS-20810,L1A,36.5K
R61	3G6	KS-20810,L1A,10K
R62	3C6	KS-20810,L1A,1.24K
R63	3C5	KS-20810,L1a,511

TRANSISTOR

DESIG	LOC	CODE
Q3	3C4	66L
Q4	3C5	66L
Q5	3C4	66L
Q8	3E6	51B
Q11	3F7	51B
Q12	3F6	51A
Q13	3G6	66G

VARISTOR

DESIG	LOC	CODE
RV5	3C2	106A
RV6	3C5	106A
RV7	3D4	106A

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT	SD-3C217-01-C1
BELL TELEPHONE LABORATORIES INCORPORATED	6S

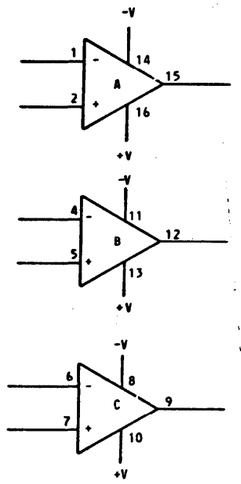
ISSUE 6B

BELL SYSTEM PROPRIETARY INFORMATION
NOT FOR PUBLICATION OR
OUTSIDE DISTRIBUTION

SD-3C2[illegible]-01-C1

INFORMATION NOTES (CONT)
3.02 IC DEVICE CIRCUIT ELEMENTS

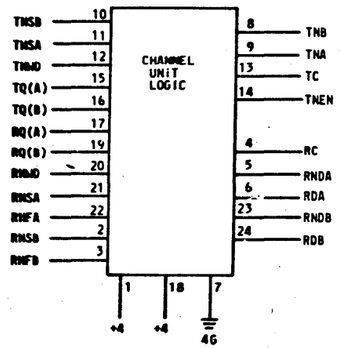
(A) 559A HYBRID INTEGRATED CIRCUIT TRIPLE OPERATIONAL AMPLIFIER

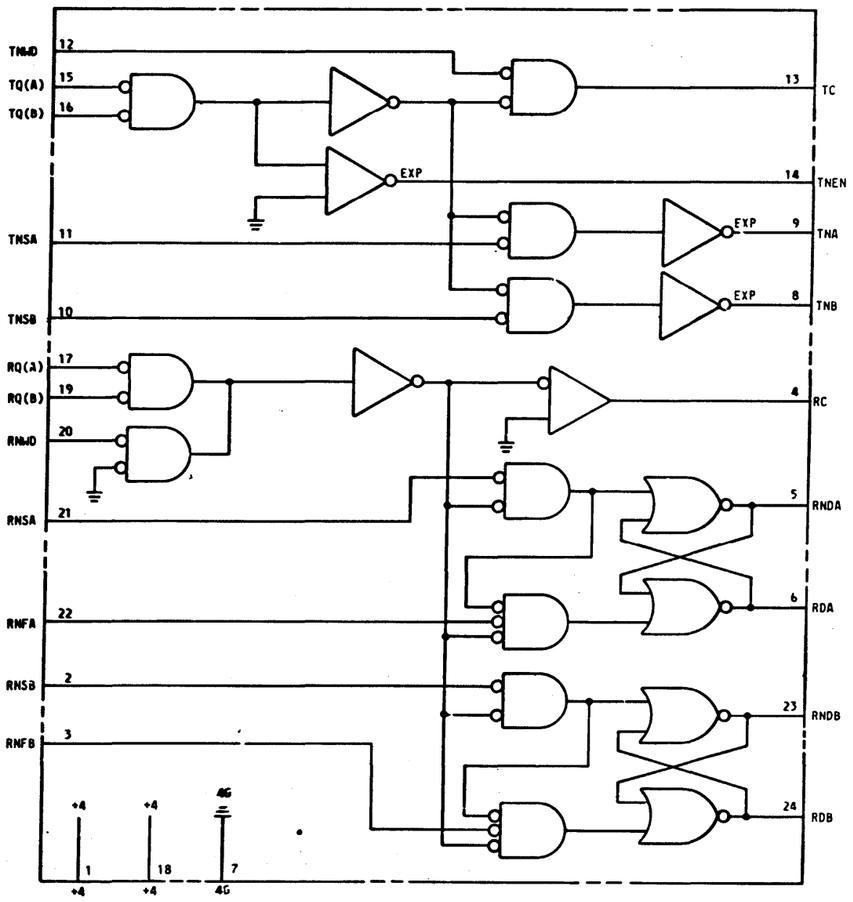


INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

(B) 129F CHANNEL UNIT LOGIC





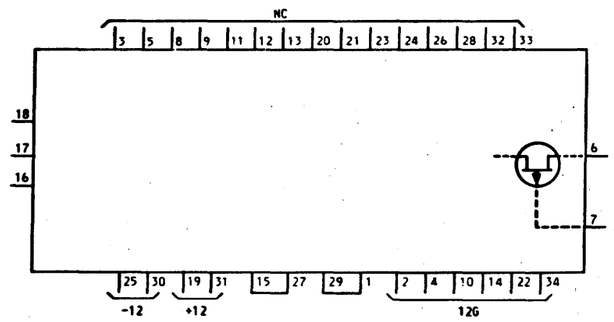
INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT	SD-3C217-01-D2
BELL TELEPHONE LABORATORIES INCORPORATED	6S

INFORMATION NOTES (CONT)
3.02 IC DEVICE CIRCUIT ELEMENTS

(c) 525E RECEIVE ACTIVE FILTER



INPUT/OUTPUT INFORMATION

PIN 6 IS THE PRIMARY CHANNEL INPUT FOR THE RECEIVE PULSE AMPLITUDE MODULATED SIGNAL.

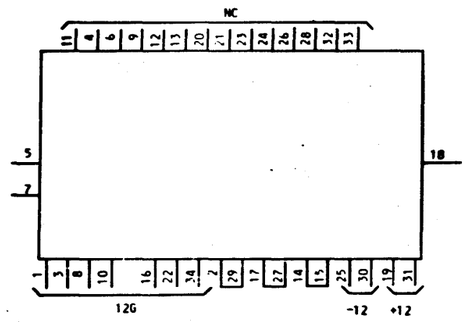
PIN 7 IS THE TIMING INPUT REQUIRED TO SAMPLE THE INDIVIDUAL CHANNEL.

PIN 17 IS THE PRIMARY CHANNEL OUTPUT FOR THE RECONSTRUCTED VOICE FREQUENCY SIGNAL.

CIRCUIT DESCRIPTION

THE RECEIVING ACTIVE FILTER RECONSTRUCTS THE TRANSMITTED WAVEFORM FROM THE RECEIVED SAMPLES. IT EFFECTIVELY HAS A LOW PASS CHARACTERISTIC WHICH SUPPRESSES FREQUENCY COMPONENTS IN THE INPUT ABOVE 4kHz.

(d) 525F TRANSMIT ACTIVE FILTER



INPUT/OUTPUT INFORMATION

PIN 5 IS THE PRIMARY VOICE FREQUENCY SIGNAL INPUT.

PIN 18 IS THE FILTERED VOICE FREQUENCY OUTPUT.

CIRCUIT DESCRIPTION

THE TRANSMIT ACTIVE FILTER IS A LOW-PASS FILTER WHICH EFFECTIVELY SUPPRESSES FREQUENCIES ABOVE 4kHz. THESE FREQUENCIES WOULD PRODUCE MODULATION PRODUCTS BELOW 4kHz IF THEY WERE NOT SUPPRESSED.

SD-3C217-01-03

3A

4-WIRE FOREIGN EXCHANGE SUBSCRIBER END CHANNEL UNIT	SD-3C217-01-D3
BELL TELEPHONE LABORATORIES INCORPORATED	SIZE 6S