

# Introducing ACARS



## ■ ACARS FREQUENCIES

MHz	Function
131.550	Primary USA/Canada
130.025	Secondary USA
129.125	Tertiary USA
131.725	Primary Europe
131.450	Primary Japan
131.475	Private Air Canada

## ■ ACARS DECODERS



### Universal ACT-1 Interface

This compact PC interface simply plugs into the serial port of your PC. The supplied user-friendly software includes mouse support. You can view, filter, print and save the data. You can also view, search and print previously logged data. Includes a free copy of the book *Understanding ACARS*. Under \$100.

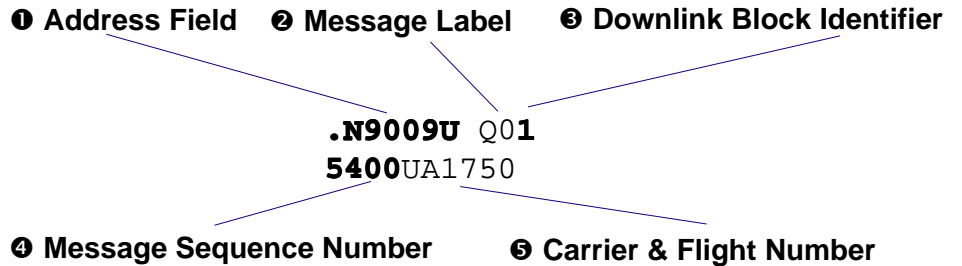
### AOR ARD-2

Here is a "go anywhere" decoder for ACARS and NAVTEX. It provides portable operation from 4 internal AA cells (not supplied) or external 12VDC, and a computer is not required. ACARS is the VHF teletype mode audible on most scanners. NAVTEX stands for Navigational Telex, sent predominantly on the longwave frequencies of 518 and 424 kHz, audible on most short-wave communications receivers. Incoming text is displayed on the 16 character by 2 line LCD display. A built-in speaker with volume control allows you to monitor activity. A 9600 baud DB9 serial port is provided for optional use with a personal computer. Under \$400.

Aeronautical Radio, Inc. (commonly known as: "ARINC") maintains a huge VHF and HF voice network throughout the United States and overseas to provide operational radio communications for the aircraft industry. In the early eighties they developed an addressable, digital data link for commercial and business jets and their respective companies known as ACARS. ACARS stands for **Aircraft Communications Addressing and Reporting System**. It was produced to reduce the flight crew's work-load by using modern computer technology to exchange many routine reports and messages. This improves the safety and efficiency of modern air travel.

ACARS uses the AM mode because the same airborne VHF radio is often also used for voice communications. Burst transmissions are used with a limit of 220 characters per message. Transmissions often last less than one second! Therefore when monitoring ACARS it is important to leave your receiver's squelch off. To monitor ACARS transmissions you will need a VHF scanner or receiver capable of tuning the VHF (AM) aircraft band 118 to 136 MHz.

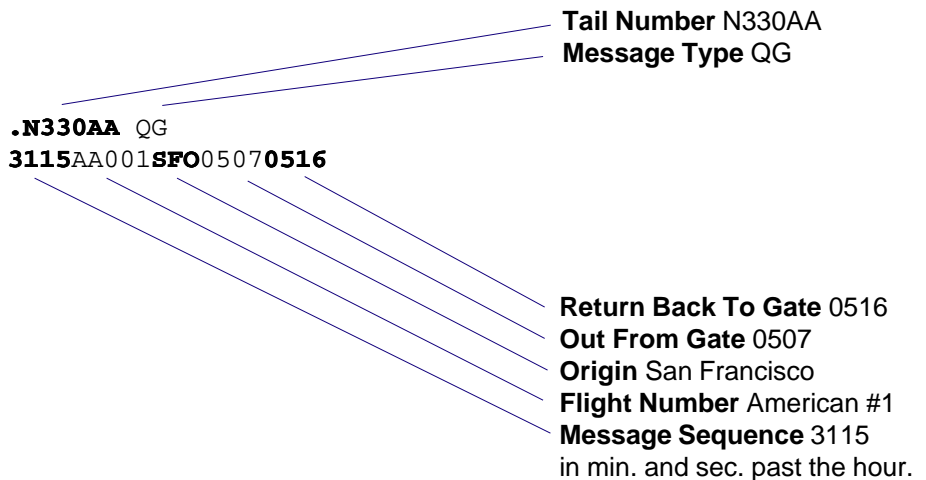
ACARS messages are very structured. Each position in the message has a specific function. The very common *Q0 Link Test* is shown as an example below.



There are nearly one hundred "standard" ACARS message formats plus a virtually unlimited number of airline specific company formatted message types. The following two examples are typical of standard ACARS message formats.

The **QG OUT/RETURN IN REPORT**, like many other ACARS downlinks, is transmitted automatically. Many ACARS downlinks are sent automatically as a result of on-board sensor activation, especially during takeoff and landings. This report is transmitted by an aircraft that leaves the gate, but for some reason must return back to the gate.

## ◆ QG - OUT/RETURN IN REPORT



◆ Q1 - DEPARTURE/ARRIVAL RPT.

This report is sent from the aircraft informing the ground station the time it left the gate, the wheels-up time, the destination, fuel and other data.

Tail Number N370 US Air  
 Message Type Q1  
 Out 0731  
 Off 0743  
 Fuel 0300  
 Destination Pittsburgh  
 Free Talk  
 Captain First Officer Flight Attendant

N370AU Q1  
 4243AL0604SFO07310743 0300PIT/FP 431/DC 0730/CO 29849/FO 37531/A1 30152/A  
 30588/A3 34613 7

Origin San Francisco  
 Flight  
 Message Sequence 4243  
 in min. and sec. past the hour.

■ MESSAGE TYPES

Label	SMI	Message Title	Label	SMI	Message Title
_j		No info to transmit. Polled mode <sup>1</sup>	CB	↔	Printer status = busy
_DEL↕		General response, Demand mode; no information to transmit <sup>1</sup>	CC	↔	Printer status = local
00	↓ HJK	Emergency situation report	CD	↔	Printer status = no paper
2S		Weather request	CE	↔	Printer status = buffer overrun
2U		Weather	CF	↔	Printer status = reserved
4M		Cargo information	F3	↓	Dedicated transceiver advisory
51		Ground GMT request response	H1	↕	Message to/from terminal
52	AGM	Ground UTC request	HX	↓ REJ	Undelivered uplink report
54	↕	Aircrew initiated voice contact request	M1	↓ MVA	IATA Departure message
57	↓ AEP	Alternate aircrew initiated posit. rpt.	M2	↓ MVA	IATA Arrival message
5D	↓ TIS	ATIS request	M3	↓ MVA	IATA Return to ramp message
5P	↓	Temporary suspension of ACARS	M4	↓ MVA	IATA Return from airborne message
5R	↓ AEP	Aircraft initiated position report	Q0		ACARS link test
5U	↓ WXR	Weather request	Q1	↓	ETA Departure/arrival reports
5Y	↓ ETA	Revision to previous ETA	Q2	↓ ETA	ETA reports
5Z	↓ AGM	Airline designated downlink	Q3	↓ CLK	Clock update
7A	↓ ENG	Aircraft initiated engine data	Q4	↑	Voice circuit busy (response to 54)
7B	↓ ABM	Aircraft initiated misc.message	Q5	↔	Unable to process uplinked messages
80-9	↓	Aircraft addressed downlinks	Q6	↓	Voice-to-ACARS change-over.
A1	↑ CLX	Deliver oceanic clearance	Q7	↓ DLA	Delay message
A2	↑ CLD	Deliver departure clearance	QA	↓ DEP	Out/fuel report
A4	↑ RCA	Acknowledge PDC	QB	↓ DEP	Off report
A5	↑ RPR	Request position report	QC	↓ ARR	On report
A6	↑ RAR	Request ADS report	QD	↓ ARR	In/fuel report
A7	↑ FTU	Forward free text to aircraft	QE	↓ DEP	Out/fuel destination report
A8	↑ DDS	Deliver departure slot	QF	↓ DEP	Off/destination report
A9	↑ DAI	Deliver ATIS information	QG	↓ RTN	Out/return in report
A0	↑ AFN	ATIS Facilities notification	QH	↓ DEP	Out report
B1	↓ RCL	Request oceanic clearance	QK	↓ ARR	Landing report
B2	↓ CLA	Request oceanic readback	QL	↓ ARR	Arrival report
B3	↓ RCD	Request departure clearance	QM	↓ ARR	Arrival information report
B4	↓	Ackn. departure clearance	QN	↓ DIV	Diversion report
B5	↓ PPR	Provide position report	QX	↓	Intercept
B6	↓ PAR	Provide ADS report	RA	↑ RPR	Command aircraft term. to transmit data
B7	↓ FTD	Forward free text to ATS	RB	↓	Response of aircraft terminal to RA msg.
B8	↓ RDS	Request departure slot	::	↑	Command aircraft xcvr to change freq.
B9	↓ RAI	Request ATIS information			
C0	↑	Uplink msg. to all cockpit printers			
C1	↑	Uplink msg. to cockpit printer #1			
C2	↑	Uplink msg. to cockpit printer #2			
C3	↑	Uplink msg. to cockpit printer #3			
CA		Printer status = error			

<sup>1</sup> These are non-printing characters, and will not be displayed.

Message Direction	
↓	Downlink.
↑	Uplink.
↕	Uplink or downlink.
↔	Ground to ground.

## ■ ABBREVIATIONS

0A	Passengers in first class	OF	Time off	AEP	ICAO position report with wx.
0B	Passengers in business class	ON	Time on	AGM	Start of standard message
0C	Passengers in coach class	OP	Oil pressure	ALT	Altitude
AL	Flight level	OS	Other supplementary info.	ALT	Altimeter
CG	Center of gravity	OT	Time out or oil temperature	APP	Approach
CI	Cost index	OV	Present location (over)	AWD	Automated weather data
CL	Cruising level	PB	Number of persons on board	BBG	in reference to HAZMAT cargo
CR	Company route	PD	Point of departure	BKN	Broken
CW	Cruise wind	PW	Position weather	CHP	Chop
CZ	Cruising speed	QN	Altimeter settings	CLR	Clear
DA	Departure aerodrome	RD	Departure runway	CPT	Captain
DG	Drag factor	RF	Request flight level	CRZ	Cruise altitude
DP	Dew point	RI	Return in time	CVG	Covering
DS	Destination station	RL	Requesting cruising level	DAI	Display aircraft itinerary
E1-9	Engine parameters	RM	Remarks	DBI	Data base initialization-update
EO	Estimated time over	RO	Return on time	DDG	in reference to HAZMAT cargo
FB	Fuel on board	RT	Route information	DDX	Display dispatch message
FC	Estimated further clearance	RL	Request cruising level	DEV	Display aircraft deviations
FD	Fuel over destination	SA	Latest weather	DFR	Display flight routing
FF	Fuel flow factor in lbs/hr.	SI	Special communication	DLD	in reference to cargo
FI	Flight Identification	SK	Sky conditions	DTX	Display text
FL	Flight level	SL	Selcal code	EDA	Engine data
FO	First officer	SP	Significant point	EFC	Expect final clearance
FR	Fault report prefix	ST	Standard takeoff power	EGT	Exhaust Gas Thrust
FX	Enroute fix	TA	Static air temperature	ENG	Engine data
GL	Geographical location	TB	Turbulence	EOK	Everything "OK"
HD	Aircraft heading	TD	Takeoff temperature	EON	Expected touchdown time
IC	Aircraft icing	TE	Time enroute	EPR	Exhaust pressure ratio
IN	Time in	TM	Surface air temperature	ERR	Error message
IR	In range (of VHF radio)	TO	Time over	ERT	Estimated ramp time
LA	ID of officer landing aircraft	TP	Transmission path	FDD	Flight data recorder info
LT	Light	V1	Velocity 1	FLR	Fault report
MA	Message assurance	VR	Rotate speed (& runway vis rng)	FLT	Flight
MN	Maintenance	V2	Velocity 2	FOB	Fuel on board
MT	Maximum takeoff power	WI	Weather	FPR	Flight plan request
N1	Speed of turbine 1	WV	Wind information	FRM	Maintenance codes
NA	Navaid	WR	Warning prefix	FTM	used before waypoint name
NL	Number of landings	WX	Weather	LIF	request for Load information
NP	Next report point	ZW	Zero fuel weight	LND	Landing
APRCH	Approach			MCH	Mach (aircraft speed)
ARINC	Aeronautical Radio Inc.			MEL	Minimum essential list
ATISRQ	ATIS request			OCC	Occasional (weather)
AWDAF	Auto Wx Data-Area Forecast			OFF	Off time
AWDFT	Auto Wx Data-Terminal Area Forecast			OUT	Out time
AWDSA	Auto Wx Data-Air route Forecast			OVR	Over
CLIMB	Climbing			POS	Position
CRUISE	Cruise level			PWD	Predicted weather data
DESCEN	Descending			RVR	runway visual range
INCLIMB	In climb			SAT	Static air temperature
INRANG	In range of (VHF)			SMI	Standard message identifiers
INRP	In report			SMT	Standard message text
LEVEL	Level flight			TEI	Text element identifiers
LIVE	Live cargo (animals)			TIS	ATIS information
OFFRP	Off report			TKO	Takeoff
ONRP	On report			TRB	Turbulence
OUTRP	Out report			TXT	Text
PIREP	Pilot's report			TYP	Type
POSWX	Position weather			VEC	Vector
TYP 1	Type 1 weather request			WND	Wind (direction/velocity)
UDCST	Undercast sky			WOB	Weather observation
WXRQ	Weather request			WRN	Warning
				WXA	Weather at
				WXR	Weather

## ■ AIRPORT IDENTIFIERS

IATA	ICAO	Airport
ATL	KATL	Atlanta, GA
BDL	KBDL	Hartford, CT
BER	EDBB	Berlin, GERMANY
BHM	KBHM	Birmingham, AL
BKL	KCLE	Cleveland, OH
BNA	KBNA	Nashville, TN
BOS	KBOS	Boston, MA
CDG	LFPG	Paris, FRANCE (de Gaulle)
CGX	KORD	Chicago, IL (Meigs)
CHC	NZCH	Christchurch, NEW ZEALAND
CHI		Chicago, IL
CMH	KCMH	Columbus, OH
CVG	KCVG	Cincinnati, OH (Covington, KY)
DFW	KDFW	Dallas-Ft. Worth, TX
DCA	KDCA	Washington, DC (National)
DEN	KDEN	Denver, CO
DTW	KDTW	Detroit, MI
EWR	KEWR	Newark, NJ
FCO		Rome, ITALY (Da Vinci)
IAD	KIAD	Washington, DC (Dulles)
JFK	KJFK	New York, NY (Kennedy)
LAX	KLAX	Los Angeles, CA
LGA	KLGA	New York, NY (La Guardia)
LGW	EGKK	London, ENGLAND (Gatwick)
LHR	EGLL	London, ENGLAND (Heathrow)
MCO	KMCO	Orlando, FL
MEM	KMEM	Memphis, TN
MDW	KMDW	Chicago, IL (Midway)
MEX	MMMX	Mexico City, MEXICO
MIA	KMIA	Miami, FL
MUC	EDDM	Munich, GERMANY
MSP	KMSP	Minneapolis/St. Paul, MN
MSY	KMSY	New Orleans, LA
NRT	RJAA	Tokyo, JAPAN (Narita)
NYC	KEWR	New York, NY (Newark-NJ)
OAK	KOAK	San Francisco, CA (Oakland)
ORD	KORD	Chicago, IL (O'Hare)
ORY		Paris, FRANCE (Orly)
PHL	KPHL	Philadelphia, PA
PIT	KPIT	Pittsburgh, PA
PWK	KPWK	Chicago/Wheeling, IL
SFO	KSFO	San Francisco/Oakland, CA
SLC	KSLC	Salt Lake City, UT
STL	KSTL	St. Louis, MO
SNN	EIAA	Shannon, IRELAND
TPA	KTPA	Tampa/St. Petersburg, FL
TPE	RCTP	Taipei, TAIWAN
YYZ	CYYZ	Toronto, ON-CANADA

## ■ FURTHER READING

**Understanding ACARS - Third Edition** By Ed Flynn  
 This detailed and informative book takes the mystery out of decoding ACARS. (Universal) Price: \$ 9.95

**The Worldwide Aeronautical Communications Frequency Directory - Second Edition** By R.E. Evans  
 The most complete and up-to-date aero frequency directory ever published. Over 2350 frequencies covering voice and data on HF, VHF & UHF. (Universal) Price: \$19.95

## ◆ PLAIN TEXT MESSAGES

The ACARS system can also be used to passing routine text traffic as in the following example:

```
.N908UA

ESTIMATING ARRIVAL
AFTER CURFEW, LOCAL
MANAGEMENT WILL
MAKE DECISION
WHETHER TO LAND
AFTER CURFEW OR
DIVERT. THIS
INFORMATION WILL BE
RELAYED TO FLIGHT
ENROUTE BY CHIEF.
PENALTY FOR CURFEW
VIOLATION WILL BE
HANDLED BY LGB.
(CHIDD PEK 07/28/
90)
```

This message was to a crew who was going to be late in landing at Long Beach.

## ■ AIRLINE CARRIERS

ICAO	IATA	Airline	Country
AAL	AA	American Airlines	U.S.A.
ACA	AC	AirCanada	Canada
AWE	HP	America West	U.S.A.
BAW	BA	British Airways	U.K.
COA	CO	Continental Airlines	U.S.A.
DAL	DL	Delta Airlines	U.S.A.
DHL	ER	DHL Airways	U.S.A.
FDX	MB	Federal Express Corp.	U.S.A.
FTL	FT	Flying Tiger Line	U.S.A.
FWL		Florida West Airlines	U.S.A.
HAL	HA	Hawaiian Airlines	U.S.A.
IBE	IB	Iberia Airlines	Spain
NWA	NW	Northwest Orient	U.S.A.
OZA		Ozark Airlines	U.S.A.
PAI	PI	Piedmont Aviation	U.S.A.
QFA	QF	Qantas Airways	Australia
SWA	SR	Swissair	Switzerland
TWA	TW	Trans World Airlines	U.S.A.
UAL	UA	United Airlines	U.S.A.
UPS	SX	United Parcel Service	U.S.A.
USA	US	U.S. Air	U.S.A.

**IATA** = International Air Transport Association  
**ICAO** = International Civil Aviation Organization